RAILROAD GAZETTE

FRIDAY, FEBRUARY 8, 1878.

Contributions.

The Baggage Car: Its Traffic, Occupants and Surroundings.

BY PAUL STORKE.

II.

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THROUGH EMIGRANT BUSINESS.

The minutiæ observed in accounting for the charges collected for the transportation of extra baggage belonging to emigrants ticketed through over various connecting lines have always been, and are, exceedingly incomplete, ill-digested and unfair in their workings.

A few lines not only ticket the emigrants to their destination, but they also check the luggage of the emigrants through. As a rule, no distinguishing mark is put upon the baggage to enable the different lines interested to distinguish the common from the extra baggage.

It has been, and is, the custom in some cases to enter on the passage ticket of the emigrant the quantity or weight of extra baggage he is entitled to, *i. e.*, the amount he has paid for at the starting point. The amount in dollars and cents is seldom if ever entered. It occasionally happens that the weight is written upon each coupon attached to the ticket purchased by the emigrant.

It is a practice in some instances to make no entry whatever upon the passage ticket of the quantity of extra baggage paid for. Instead of this, a receipt is given the emigrant to enable him to claim his baggage without further payment when he reaches his destination, in the event any dispute should arise.

In cases of this kind it is manifestly the intention of the collecting party not to allow any proportion of the amount collected to the different lines over which the excess weight has to pass to reach its destination.

This omission is sometimes sought to be justified upon the ground that the amount of joint revenue thus confiscated justly belongs to the collecting company as a reimbursement for its expenses in connection with the emigrant business. A sufficient answer to this ought to be, and is, that if the emigrant business is not profitable in itself, it should not be sought after with so much assiduity and at such great expense.

In any event any expense incurred should be made to appear, as in other cases. If it is desired that connecting lines should pay a portion of the expenses of securing emigrant business, an agreement should first be entered into with such lines, specifying the proportion they shall pay. Bills for these expenses should be rendered, so that the companies may know how much the business is costing them and what the items are that make up such cost. To filch these expenses from the revenue that should accrue to the different lines from the transportation of the baggage of emigrants is not creditable, or in accordance with good business usage.

We can hardly fail to appreciate the great injustice of the practices named above when we remember that the collections for the immense quantities of extra baggage transported annually for emigrants are not distributed, generally, over the whole country, but are restricted to one or two lines that possess, practically, a monopoly of the whole business.

The interests of these few are thus arrayed against any equitable and systematic division of the large and profitable traffic arising from the transportation of the extra baggage of emigrants. They may, therefore, be expected to oppose any arrangement that compels such a division.

The aggrieved companies have it in their power at any time to compel full and correct accounting; but the want of unanimity among them, and the absence of a definite and feasible plan for conducting the business has heretofore prevented it.

The cut-throat or piratical lines have always been willing to waive any and all claims they might have to a portion of the revenue from extra baggage, provided they were allowed what they claimed to be their proportion of the general business. The conservative and well managed lines have thus in a measure been compelled to tacitly acquiesce in the present unjust and indefensible practices until such time as these practices could be broken up.

However, all the obstacles we have mentioned could and would have been overcome except for the fact that, as we have already intimated, the baggage traffic generally is looked upon as a bastard whom nobody owns. Whether the business brings in more or less revenue is not remarked; it is a species of perquisite; a plum that can be used to facilitate other business without the cost appearing.

THE MANAGEMENT OF EMIGRANT AND OTHER INTER-ROAD BAGGAGE TRAFFIC.

To resume the description of the *modus operandi* of carrying on the through or inter-road business as at present conducted:

The practice of entering the quantity of extra baggage on the passage ticket of the passenger has already been described. When the passenger reaches the terminal line the conductor on such line takes up the ticket and returns it to the ticket accountant with his other collections, so that when the baggage finally reaches its destination the agent has no means whatever of determining whether anything has been collected for the excess, and if so whether the amount collected was correct or not. He is consequently compelled to accept the statement of the emigrant.

As a rule the intermediate lines over which emigrant baggage passes possess no tangible evidence or voucher whatever save the notation on the stub of the ticket.

It will be found upon investigation that the remarkable peculiarities that surround the conduct of the baggage traffic in connection with the emigrant business are not wanting when we come to investigate the practices in connection with the manner of treating collections made from ordinary or first-class passengers destined to points on other lines.

When extra baggage collections are made from such common or first-class passengers it has been, and is, largely the custom for the forwarding company to collect the total charges due on the excess and check the baggage through to its destination. But no account whatever is rendered by the collecting company to the other lines for their proportion.

A system that is based upon such a practice or that renders such practices possible cannot be defended.

Of course when such practices are followed by all companies, the injustice partly equalizes itself, but the circumstances attending the business of certain companies will always make them the greatest sufferers.

PROPER ACCOUNTING FOR EXTRA BAGGAGE.

It is not difficult to provide a simple and efficacious remedy for all the crudities we find in connection with the transportation of the extra baggage of emigrants and other through passengers.

The forwarding or collecting company should be compelled in all cases to attach to the extra baggage a way-bill or card stating the weight, amount collected and by whom collected; the bill should also be numbered and dated.

A record of this bill could be taken by each of the lines over which the baggage passed and they could then, by requiring a detailed report, compel the collecting company to account accurately for the proportion belonging to each of the lines interested.

Upon the arrival of the extra baggage at its destination the agent would detach the way bill after having verified its correctness by carefully re-weighing the baggage.

The charges on all baggage received to which no way-bill was attached would be collected by the receiving agent and reported to his company.

It would be the duty of such company in such cases to report to the other companies interested the proportions severally their due.

A system of this kind seems to be required; its effect would be to protect each of the companies; it would be a necessary and proper check upon the collecting agent, and would guard the emigrant or passenger in a measure against injustice or outrage.

In connection with the local baggage traffic it may be stated that, to enable the receiving agent to ascertain definitely the place from which the extra baggage was shipped, it is necessary that the train baggageman's way-bill should give the name of the forwarding station. Any other distinguishing mark or check attached to the baggage would of course do as well. Inter-road checks, as a rule, give the name of the station where shipped and the name of the destination as well.

COLLECTIONS SHOULD BE MADE BY THE RECEIVING AGENT.

As a rule, all collections for baggage-car traffic should be made by the receiving agent, *i. e.*, by the agent at station to which the traffic is destined.

As already explained, the forwarding agent is frequently unable, for want of time, to ascertain whether the baggage presented to be checked comes under the head of extra baggage or not. It should be the duty of the agent at the terminal point to discover these omissions and correct them.

Although the forwarding agent does not always have the time necessary to examine into each case, yet he should in every instance possible to him indicate in some simple way to the receiving agent every package that comes under the head of extra baggage. In the majority of cases he will be able to attach a way-bill to the packages, specifying the weight and amount that should be collected. Frequently, however, his figures will be only approximately correct, the weight of the packages being estimated. To remedy these defects, it should, of course, be the duty of the receiving agent, in all cases, carefully and dispassionately to review the statements of the forwarding agent.

ORDERS OR FRANKS FOR EXTRA BAGGAGE.

In the majority of instances, the charges due for extra baggage will be paid in cash, but it will frequently occur that passengers will present orders or franks in payment of the charges due. These franks are sometimes good only for a definite amount of baggage between certain points named; then again they are made to call for a definite amount of baggage, but are good between all points on the line and run for a stated number of days, weeks or months. The latter may be called season permits.

These permits, season and otherwise, issued for various good and sufficient reasons, will be found exceedingly troublesome when an attempt is made to simplify the accounting.

To cover the case of season permits mentioned, it would be well perhaps to provide agents with a particular form of bill to attach to the baggage. The bill should recite the place of shipment, date of shipment, name of party presenting the frank, number and date of frank, by whom issued, and quantity of baggage entitled to passage, etc., etc. The receiving agent should detach the way-bill and transmit it to the Ticket Auditor,* so that its authenticity may be established. The Ticket Auditor should also compare the way-bill so returned with previous bills returned for the same passenger. The effect of this comparison will be to prevent or expose, in the majority of cases, any attempt to hide actual cash collections, under cover of some season frank known to be outstanding.

A way-bill should be attached by the forwarding agent to all extra baggage shipped upon mileage tickets, the local charges being entered as in other cases.

DISPOSITION OF WAY-BILLS, FRANKS, ETC.

Upon the arrival of the baggage at its destination the way bill should be detached by the receiving agent and transmitted to the Ticket Auditor. If charges are paid with cash, the amount should be entered under the head of cash, in the place provided on the ticket. If the charges are paid with mileage coupons, then coupons covering the specific miles the baggage has been transported should be detached and inclosed with the way-bill, the amount having first been entered on the bill in the place provided. If a season permit is presented in lieu of cash or mileage tickets, then a description of such permit should be entered in the proper place. Where payment is made with a trip pass or frank, such payment should be inclosed with the way-bill to the ticket accountant.

All orders or franks that cannot be used but once should be taken up by the receiving agent when presented.

AUDITOR'S STUB OR CHECK.

All franks, orders, coupons or other books or tickets calling for the transportation of baggage traffic and good for more than one trip should have a stub or auditor's check attached. This check should recite all the particulars of the ticket, its date, time good for, amount collected for it, name of party to whom issued, amount of extra baggage it covers, by whom issued, etc., etc.

This check should be detached by the agent upon the first presentation of the ticket or frank, and should be forwarded without delay to the Ticket Auditor; in the hands of that officer it is an additional and necessary check upon the party issuing the ticket, of which it is a *fac simile*.

IN CASES OF DOUBT.

When an agent is satisfied or suspects that the baggage presented to be checked is in excess of the amount the passenger is entitled to pass free, yet no time is allowed him in which to investigate the facts or even estimate the excess and fill up a way-bill for the same, then he should attach a card of some distinctive color to the baggage, as a signal to the receiving agent to investigate the case fully; and, if he (the receiving agent) finds that the baggage is properly subject to a charge under the rules governing the transportation of extra baggage, then he should make a bill covering the same.

If it is not practicable to attach a distinctive card as suggested, then the receiving agent should be notified by telegraph or through the train baggage-man.

NEED OF REFORM.

It is evident to an observer that the large amount of produce, merchandise and knick-knacks carried free in the baggage cars upon roads possessing a suburban population is of sufficient importance to warrant such roads in making an energetic and systematic effort to collect the charges due on that class of business. The express lines under contract with the railroad companies, or when operated by the road as a distinct department, undoubtedly collect a large revenue from the produce and goods carried on the suburban trains; but there is a large part of the business that escapes pay altogether. This suburban traffic that escapes without pay, while considerable in itself, is but a fragment of the business that is overlooked or ignored on the roads at large. We have explained some of the reasons for this omission; the remedy is plain.

In fact, to sum up, the whole business, both through and local, as now conducted, needs careful revision. Instead of treating the extra baggage and parcel traffic as an unknown quantity to be ignored, or traded off in an unnecessary and unprofitable effort to secure business for other departments of the service, or abandoned as worthless, the pride and ingenuity of agents, train-men and officials generally should be excited to the utmost, as it is in other departments, to see that the legitimate revenue of the company from extra baggage and goods parcels is collected and accounted for to the utmost farthing.

It is sometimes offered in objection that the cost of thoroughly organizing the baggage traffic department is not warranted by the revenue that would be derived from it. This objection is not tenable. It might originally have been offered, with the same show of reason, against any of the many sources of traffic possessed by a railroad. The expense of systematizing the baggage traffic should not prevent its consummation. The blanks required are few and exceedingly simple in their construction and cost. Every agent should, however, be supplied with all the different forms required to do the business efficiently, and his labors should be carefully and continuously supervised until he understood and appreciated the importance of this particular branch of his duties.

If the practices in force upon the different lines in reference to the conduct of baggage traffic was in all respects alike, no discrimination would be exercised and no cause of public complaint would exist.

The initiative in the business properly rests with the general passenger and ticket agents. The admirable organization possessed by these gentlemen renders a consummation of the reform, if conducted by them, easy and simple.

In the succeeding chapters the additional rules and regulations necessary to a proper conduct of the business will be more minutely sketched.

* Or General Baggage Agent or whoever has charge of the Baggage Traffic Accounts.

Mundy's Hoisting Engine.

The engravings represent a form of hoisting engine which is built by Mr. J. S. Mundy, of Newark, N. J., and is especially adapted for the work of bridge-building, pile-driving, quarries, etc. As shown by the engraving, it has a vertical boiler with two cylinders, only one of which is shown, and two winding drums. The cylinders are connected to an intermediate shaft to which a pinion is keyed fast. This gears into two large wheels on the drum shafts. The drums themselves revolve loosely on the shafts. Suitable pockets are cast in the side of each of the main driving gear wheels to receive blocks of hard, kiln-dried wood, which are tightly driven in and then turned off to a bevel so as to fit into a corresponding cavity in the drum, which thus forms a powerful friction clutch. The drums slide longitudinally on the shaft and are pressed against the wooden part of the clutch by means of hand levers attached to screws which press against the ends of the drums. These levers and screws are shown in the left side of the drums in fig. 1, and one of them on the right side in fig. 2, which is a section through the intermediate driving shaft. Ten pounds pressure applied to one of the handles is sufficient to hoist a ton. A spiral spring, shown in fig. 2, forces the drum away from the wood when the hand lever is raised and the pressure relieved. When the engine is in operation both gears revolve at the same time, and either or both drums can be thrown either into or out of gear by the levers and screws.

In driving piles the upper drum is used for raising the hammer and the lower one for raising the piles or timber, thus saving much time which is lost in connecting and disconnecting the rope to and from the hammer. No nippers are required in driving piles with this engine. A winch head is also put on the end of the lower drum shaft when required to haul timber or other purposes.

The engines have plain slide valves with locomotive cross-heads and slides, which give large wearing surfaces and are very strong. The boilers are made of best C. H. No. 1 iron, $\frac{5}{16}$ in. thick, the heads being $\frac{5}{8}$ best flange fire-box iron. The patentee and builder claims that he "can drive one-quarter more piles than can be driven with any clutch engine. The engines will run a 2,500 lbs. hammer from 15 to 20 blows per minute, raising the hammer from 15 to 20 feet high every blow."

The engine is also suited for operating a boom derrick in quarries; the stone may be raised and the boom swung at the same time.

These engines are built by Mr. J. S. Mundy, who is also the patentee, and whose address is No. 7 Railroad avenue, Newark, N. J.

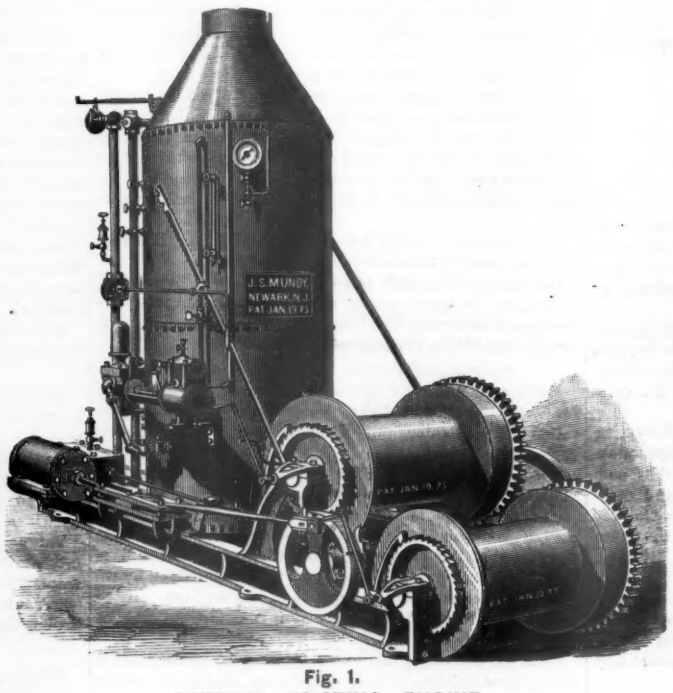

Fig. 1.
MUNDY'S HOISTING ENGINE.

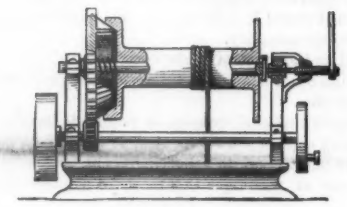

Fig. 2.

Car Spring Testing Machine by Messrs. Riehle Bros.

The tendency to test and inspect all the materials bought for use on railroads has manifested itself in the construction of the machine illustrated by the engravings herewith, which represent a machine for testing the elasticity of railroad springs, manufactured by Messrs. Riehle Bros., of No. 50 South Fourth street, Philadelphia, for the Mechanical Superintendent of the Grand Trunk Railway of Canada.

The engravings represent a machine of 10,000 lbs. capacity. The power is produced with a hydrostatic pump and jack. The plunger with its table, on which the spring is placed to undergo the test, is forced upwards towards the upper table. The pressure thus being applied is communicated to the main beam by accurate weighing mechanism, shown in fig. 2 (such as is used in all their testing machines), which is adjusted to a balance like an ordinary scale, each lever being regulated to the standard. The beam is kept in equipoise by simultaneously applying the power and placing standard weights at end of beam. The dynamic movement to test the springs under pressure is one inch and this movement is said to be, both at pressure point and end of beam, greater than in any other tester made. The surfaces or tables measure 12 in. by 12 in., and the distance apart 2 ft. 1 in. The plunger has a motion of 1 ft. 4 in. and will hold the pressure as long as desired.

The mode of operating this machine is very simple. The power may be applied with great ease and quickness, and may be withdrawn instantly after testing the specimen. By the use of proper appliances, elliptic and semi-elliptic springs of all sizes and shapes can be tested on this machine.

This firm is now building the largest testing machine they have yet turned out; its capacity will be 300,000 lbs. It is intended to test chain in lengths of 90 ft. It is for the Empire Chain Works, and it is claimed that it will be one of the most complete machines in the world. A machine of 40,000 lbs. capacity is in construction for the University of Georgia, for testing by tensile, transverse and crushing strains, also one of their horizontal wire-testing machines for the Government, to be used in the Navy Yard at Washington, and the firm is getting up a new lubricating testing machine that is expected to exceed all others in the way of improvements.

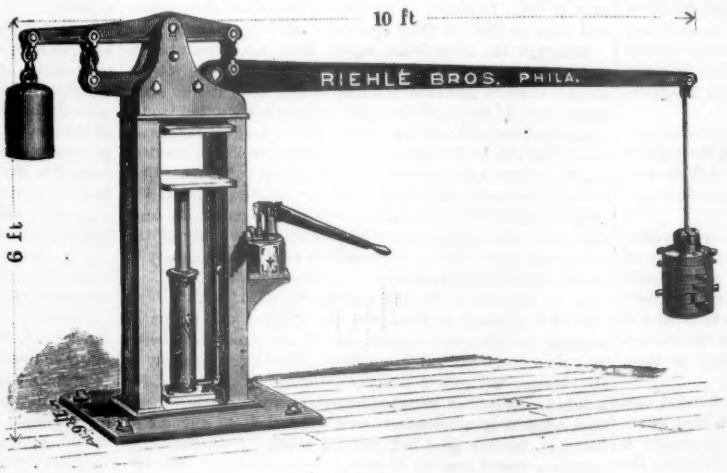

Fig. 1.
CAR SPRING TESTING MACHINE.

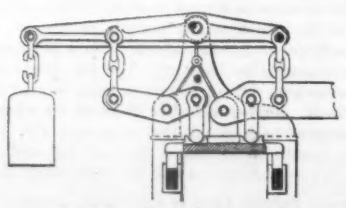

Fig. 2.

Cost of Car Lubrication.

JAN. 28, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The cost for oil, waste and tallow for lubricating cars (passenger and freight) for 1877 on this road was $283.14. Car mileage made, 1,505,049—621,254 for freight and 883,795 passenger. Hot boxes, none. Car bearing, lead and antimony in the proportion of 85 and 15, in a brass shell; nature of road, sandy and dusty; speed of passenger trains, 30 to 45 miles per hour; oil used, natural West Virginia about 26 gravity mixed in summer with a small proportion of tallow; weight of passenger cars, 32,000 to 48,000 lbs. each. The 32,000 pound cars are old-style cars used for excursions; the 48,000 pound cars are Woodruff parlor cars. Cannot find any perceptible wear on journals after three seasons' wear with this kind of bearing, or say not over $\frac{1}{16}$ of an inch at the outside. Included in the above cost is about $50 wasted by experimenting with "patent lubricants."

Who can beat this? BROAD GAUGE.

Testing Steel Rails.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Would you have the goodness to enlighten some of your readers, who may not be fully up with the times, as to the most approved practice in regard to testing steel rails; also as to the amount of injury sustained by steel rails from a say two weeks' exposure to sea water in transitu on the deck of a vessel. You would thus greatly oblige

A SUBSCRIBER.

[In answer to "A Subscriber's" inquiries we give the following specifications of tests for steel rails, which two prominent roads require the rails furnished to them to conform to. It is impossible to judge of the injury to steel rails from exposure to salt water without seeing the rails. It would seem though that the injury must be merely nominal, unless they are corroded so much as to "scale off."—EDITOR RAILROAD GAZETTE.]

SPECIFICATIONS FOR STEEL RAILS.

1. That the steel used for rails shall be made in accordance with the "pneumatic" process, and contain not less than thirty-five one-hundredths nor more than fifty one-hundredths of one per cent. of carbon.

2. That a test bar one foot long and three-quarters of an inch square is to be taken from the head of a rail made from each charge. This bar is to be supported at each end, leaving a space of eight inches between bearings, and by a sudden pressure on the centre of the bar, deflected to an angle of 80 degrees from a straight line. This angle will be made the limit between good and bad tests. If the bar bends 80 degrees without breaking, the charge will be considered good; if the bar breaks before bending, or shows signs of fracture at this angle, two more bars are to be tested; if both these bars stand the test, the charge will be considered first-class steel; but if one of them breaks, the charge will be rejected and called *second-class steel*.

3. The result of the test of each charge of which the Pennsylvania Railroad Company are to receive rails, and of which an official record is kept at each mill, is to be exhibited to the rail-inspector.

4. That the number of the charge and place and year of manufacture shall be marked in plain figures and letters on *the side* of the web of each rail.

5. That the section of the rails rolled shall correspond with the respective templates issued by the Pennsylvania Railroad Company, showing the shape and dimensions of the different rails adopted as their standard.

6. That the space between the web of the rails and *template* representing the splice-bar shall not be less than one-quarter of an inch, nor more than three-eighths of an inch.

7. That the weight of rails shall be kept as near to standard weights as can be demanded after complying with section No. 5.

8. That circular holes one inch in diameter shall be drilled through the web in the centre thereof, at equal distances from the upper surface of the flange and lower surface of the head, and $3\frac{13}{16}$ in. from the end of the rail to the centre of the first hole, and of 5 in. from the centre of the first hole to the centre of the second hole.

9. That the lengths of rails at 60 degrees Fahrenheit shall be kept within *one-quarter of an inch* of the standard lengths, which are 30, $27\frac{1}{2}$, and 25 ft. That not more than 10 per cent. of rails of the shorter lengths shall be delivered on any one contract.

10. That the rough edges produced at the ends of rails by the saw shall be well trimmed off and filed.

11. That rails are so straightened that they will insure a perfectly straight track.

12. In order to get the exact length as mentioned in paragraph No. 9, it is necessary that the rails should be cut off at as near a uniform temperature as practicable, that the blooms should not be detained in the process of rolling, and should go to the saws at a uniform temperature.

The causes for a *temporary* rejection of the rails are:

1. Bad straightening.
2. Imperfect ends (which, after being cut off, would give a perfect rail of one of the standard short lengths).
3. Missing test reports.
4. A variation of more than one-quarter of an inch from the standard lengths.

The causes for a *permanent* rejection of a rail are:

1. A bad test report, showing a deficiency or excess of carbon.
2. The presence of a flaw of one-quarter of an inch in depth in any part of the rail.
3. The presence of such other imperfections as may involve a possibility of the rail breaking in the track.
4. A greater variation between the rail and splice-bar than is allowed in paragraph No. 6.

TESTS FOR STEEL RAILS.

1. Each charge of the converter is chemically tested at the works, and its percentage of carbon ascertained. This is generally done by the "color test;" a few grains of steel being dissolved in acid, and made into a solution of given strength, the color of which indicates, by its being more or less brown, the percentage of carbon.

The rails are, or should be, numbered, so that the charge from which each was made may be recorded, and its analysis examined should the rail prove defective in use.

2. The percentage of carbon in first-class rails should not be less than $\frac{35}{100}$, nor more than $\frac{51}{100}$ of 1 per cent. of the steel. Above and below these limits, say not less than $\frac{30}{100}$ nor more than 1 per cent. of carbon, the rails are generally accepted as second class, and laid, the first, which are soft, upon sidings or branch lines, and the latter, which are hard, at stations where the wear is great and the speed low.

3. A sample bar $\frac{3}{4}$ in. wide and 12 in. long is cut from the centre of the neck of the cross end of a rail made from each charge. This bar is bent cold to an angle of 90° by a machine which applies a pressure at the centre between bearings 8 in. apart. If a sample bar breaks in the bending or shows bad cracks in the edges, while the analysis indicates that the charge is within the prescribed carbon limits, further sample bars made from the same charge are tested, and if three break out of five the rails made from

the charge are rated as second class, or rejected altogether.

4. Each rail finished shall be critically examined by an inspector, to ascertain whether it conforms closely to the template (it should not vary more than one pound per yard), whether it is perfectly straight and whether the skin or surface of the rail is smooth and free from flaws or cracks. A flaw extending ¼ in. in depth in any part of the rail classes it as second quality, more serious cracks reject them altogether, especially if in the flange of the rail.

5. An occasional cross end may be broken in the testing machine, to ascertain the transverse strength and elasticity of the rail. Standard patterns of 62 to 65 lbs. per ton should not break with less than about 60 tons applied on the upper side of the head, in the centre between bearings 2 ft. apart in the clear. It should deflect 1⅝ in. in the centre before breaking.

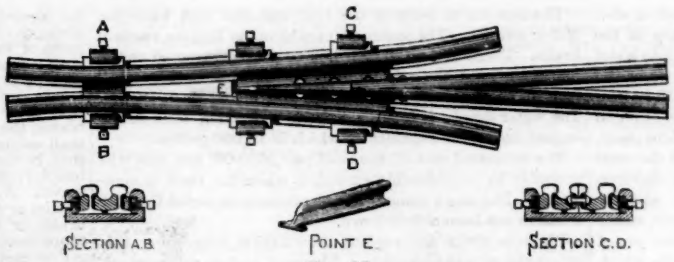

Fig. 35.

The Billerica & Bedford Two-Feet Gauge Railroad.

V.

The frogs used on this road are represented by fig. 35, and are known as Bryant's steel rail frogs. They were manufactured by the Worcester Frog and Switch Company, of Worcester, Mass. Their construction is shown very clearly by the engravings.

SWITCHES.

The majority of the switches in use on the Billerica & Bedford Railroad are also made under Mr. E. H. Bryant's patents by the same company, with the addition of a *lock lever* devised by Mr. A. H. Howland. The engravings herewith show the switch in both positions, being set for the main in fig. 36 and for the siding in fig. 37. The moving side of this switch is constructed on the principle of a "Tyler" switch, but in a greatly improved and strengthened manner. The outside lifting piece, *a a*, is made of cast iron; but is securely held against the main rail by an outside guard rail, *m n*. This casting fills the entire space between the main and guard rails (see section *A*, *B*, fig. 38), and is in no danger of becoming detached or broken—or, if by any reason it should become broken, it will still answer its purpose, as it cannot by any possible means get out of place. On the inside of the main rail, the point that protects the main track, when the switch is set on the siding, is made of a short piece of rail, *p*, properly shaped and held away from the main rail, and against the guard rail by the rubber spring *b*. The inside guard rail is kept the proper distance from the main rail and the heel of the point by means of suitably shaped distance blocks, *r r*; the whole side is then held together by means of four strong bolts, and one heavy wrought-iron clamp. On the other side of the switch the main rail is "unbroken" and does not move at all. The rail of the siding terminates in a long point, *s*, this point is moved in the opposite direction to the other side of the switch by means of the lever *e*. The end of this lever has an arm, *t*, projecting to one side. A steel spindle, *z z*, passes through suitable bearings in the lever and this arm. Between the lever and arm, on this spindle, is placed a rubber spring, *w*, which may be compressed in either direction by means of washers that rest against suitable shoulders on the spindle. This spindle is connected with the moving point by means of a bent connecting rod, *v v*, which passes under the moving side of the switch (see sectional elevation

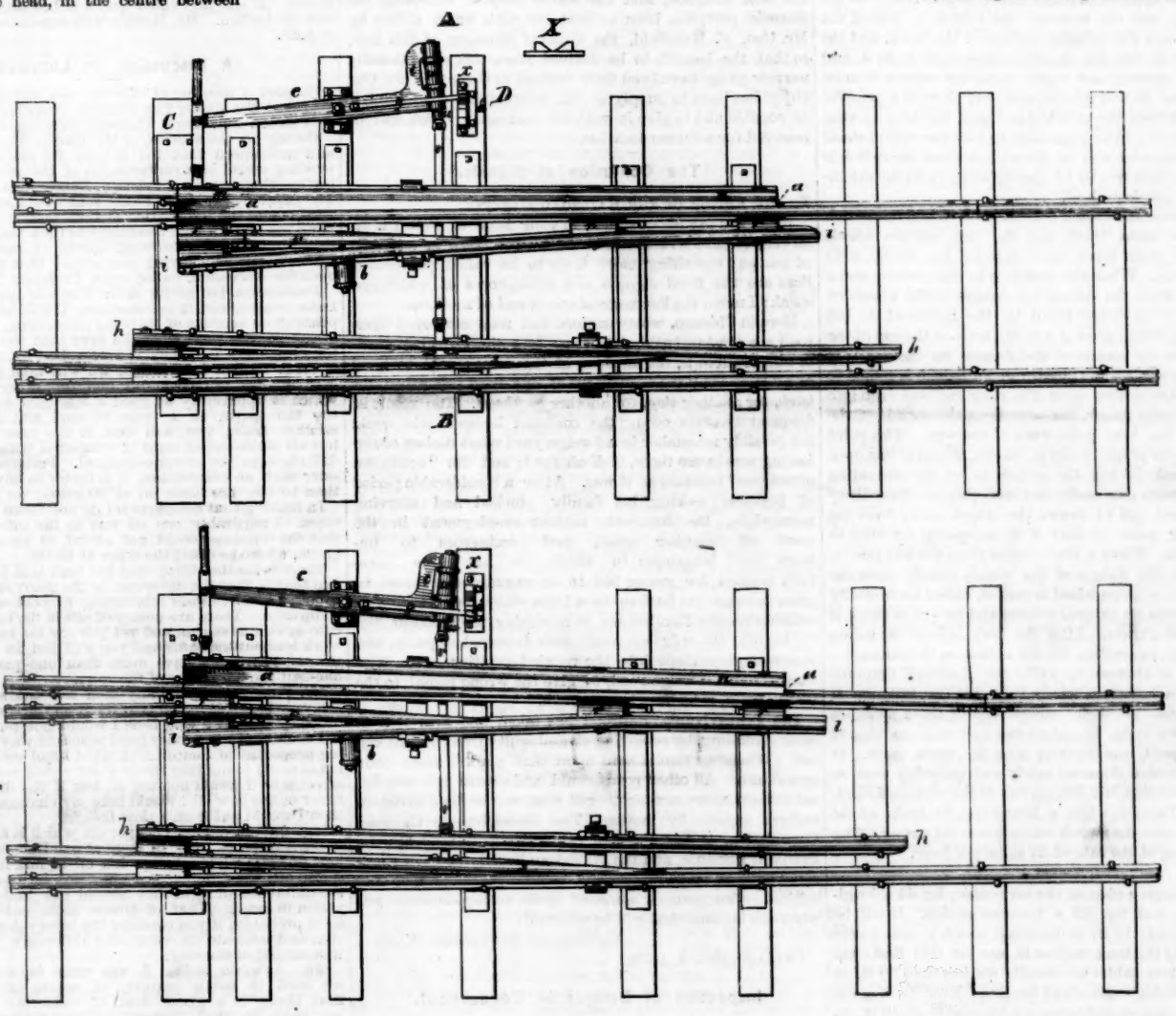

Fig. 36.

Fig. 37.

Fig. 38.

Fig. 39.

Fig. 40.

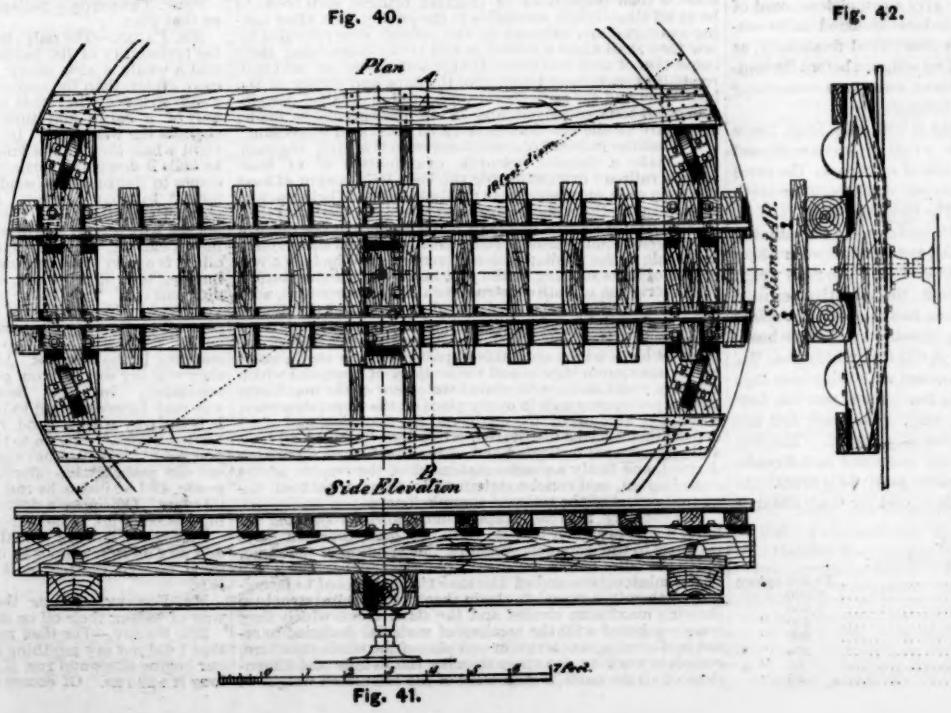

Fig. 41.

Fig. 42.

A, *B*, fig. 38). On the top of this lever is placed a steel spring, *y*, which lies in an opening cut in the top of the bearing in the end of the lever, and at times drops into a slot in the steel spindle. It will be readily seen that when the steel spring has dropped down into the spindle it will be impossible for the spindle to move in the lever; but, in order to free the spindle when the switch has been thrown into place, a hardened steel roller, *a*, is placed in the end of the steel spring. This roller passes over the surface of a cast-iron lifting-block, *x*, (shown in front elevation at *x*), and the whole is so adjusted that when the switch is in place, either on the main track or the siding, the roller is on the top of this block and has lifted the spring up out of the spindle, which is thus left free to move in either direction and compress the rubber spring; but the moment the switch is moved the roller passes down the inclined surface of the block, and the steel spring drops into the spindle and securely locks it, and does not rise entirely out again until the switch is in its proper position. It will thus be seen that there is a *positive connection* between the switch-stand and the long moving point, so that it would be impossible to lock the switch-stand unless the long point was in place; but when the switch is set the point is then free to be sprung away from its adjoining rail by the passing wheel.

The operation of the switch is as follows: When the switch is set for the main track (see fig. 36), all the wheels passing on the main track have nothing but whole, solid rails to run upon. When the switch is in this position and a train comes in from the siding, the flanges of the wheels on the inside of the curve are lifted by the incline at the left end of the long lifting-piece *a a* to the level of the top of the main rail, when by means of the flanges on the opposite wheels pressing against the guard rail *h h* (which is spiked to the ties), they are drawn over the main rail and drop into place on the main track, the wheels on the outside of the curve pressing the long point *s* out of the way. This point then returns to its proper position, leaving the main line open and unobstructed. When the switch is set for the siding (see fig. 37), trains pass easily and smoothly in either direction. The guard rail *i i* draws the wheels away from the end of the long point so that it is impossible for them to strike against it. When a train comes from the left side on the main track the flanges of the wheels merely press the points out of the way, no wheel is moved, either horizontally or vertically, from its natural course, and no jar or shock is felt by the passing train. After the train is gone the points resume their proper position for the switch on the siding.

On the 17th of December, 1877, the Railroad Commissioners of Massachusetts officially inspected the Billerica & Bedford Railroad. At their request one of these switches was set as shown in fig. 37 and a passenger train, moving at a fair rate of speed, was run over it on the main track. It is needless to say that it passed safely and smoothly over it. On an earlier occasion Mr. Briggs, one of the commissioners, was present at Taunton when a heavy freight train of 34 cars were run over the switch when it was set wrong. The train was moving at the rate of 27 miles per hour.

TURN-TABLE.

Fig. 40 represents a plan of the turn-table, fig. 41 a longitudinal section, and fig. 42 a transom section. It will be seen that this is only 18 ft. in diameter, which is sufficiently large for turning the tank engines in use on this line. On ordinary roads turn-tables are usually not less than 50 ft. in diameter for turning engines and tenders. Even for a much lighter class of engines and tenders a turn-table of 40 ft. diameter would be needed. One of the advantages of the tank engines used on this road is that the turn-tables and the engine-houses may be much smaller than would be required for engines with tenders.

The turn-table used on the Billerica & Bedford Railroad, it will be seen, is a wooden structure, and although we are not able to give its cost, from the drawing it is evident that it is a very cheap structure.

COST.

We regret that we are unable to give a complete account of the cost of this road or the indebtedness incurred in its construction. It was comparatively short-lived financially, as the road was put into the hands of an assignee before its completion. We have, however, received some data concerning its construction which may be of interest.

As we have stated before, the road is 8.63 miles long. There was in that distance 43,000 cubic yards of earth work and 542 cubic yards of loose rock and 640 of solid rock. The price paid for the grading was 35 cents per cubic yard for earth work and $1.50 for rock work. The cross-ties are 4 ft. 6 in. long × 4×6-in. section, and cost 12 cents each. The number laid per mile is 2,640, so that the distance between them measured from centre to centre is two feet. The rails weigh 25 lbs. per yard and are 30 feet long; the quantity per mile being 39¾ tons, which cost in Boston $38 per ton. The spikes are $\frac{7}{8}$ in. square and 3½ in. long measured under the head. The quantity used per mile was 2,400 lbs., which cost 2¾ cents per pound. The rails are fastened with fish-plates 15½ in. long, a pair of which weigh 5⅛ lbs. Each pair has four bolts ½ in. diameter and 2¼ in. long. One bolt and nut weighs a trifle (½ oz.) over a quarter of a pound. The fish-plates cost 2 cents per pound and the bolts and nuts 4 cents, making the whole cost of a complete joint 14¾ cents. As there are 352 of them per mile, their cost for that distance is $51.93.

EQUIPMENT.

The equipment and its cost are as follows:

Two locomotives	cost	.....	$3,500 apiece
One passenger car	"	.....	2,000
" combination	"	.....	1,950
Two excursion	"	.....	490 "
One box	"	.....	360 "
Six platform	"	.....	260 "
Two hand	"	.....	65 "
Three push	"	.....	35 "

The cars are all built of the best material and have the Miller coupler. The passenger cars have the Empire vacuum brake. There are no station houses yet constructed on the line of the road, the only buildings being a car shed 22×112 feet, an engine-house 22×36 feet, and a coal shed 18×32. The water supply is furnished from a wooden tank in the engine house, the capacity of which is 15,000 gallons.

The estimated cost of the road was $60,000, but this will probably be considerably exceeded when the road is completed. The exact amount of indebtedness incurred thus far we have not been able to learn.

We have given as complete information concerning this enterprise as was accessible. The road and its rolling stock are well designed, and the whole project, excepting the financial part, has been carried out with much ability by Mr. Geo. E. Mansfield, the General Manager of this line, so that the benefits to be derived from this exceptionally narrow gauge have been fully realized in this project. Our object has been to supply as full information concerning it as possible and to give it without comment, which will be reserved for a future occasion.

The Confusion of Signals.

TO THE EDITOR OF THE RAILROAD GAZETTE:

What you say about signals in your issue of Feb. 1 is deserving of most serious consideration, yet there is one part of railway signalling more truly to be called pantomime than are the fixed signals and semaphores of which you speak: I mean the language of colors and of motions.

Here in Chicago, where engines and men employed upon road are constantly required to go into the crowded yards of other railroads, the meaning of the same signal by hand or by lamp is by the regulations of one road prescribed for *back*, for another *stop*, for another *go ahead*. The result is, frequent disasters occur; the confused innocent who could not possibly remember in a foreign yard what dialect of signalling was in use there, is discharged; and the "confusion of tongues" remains as it was. After a considerable period of hopeless seeking, his family pinched and starving meanwhile, the innocent obtains employment in the yard of another road, and endeavors to unlearn the language in which he has been carefully trained for years; but in an unguarded moment he gives the signal to *back up* to a train which ought to *stop*; a collision results, families are in mourning, the innocent flies for his life; the railroads repair their damaged property, and a new employe steps into the vacated position, sure, if he comes from a foreign road, to give the wrong signal to the wrong train, if he lives long enough.

The Pennsylvania Railroad has taken one firm step in color signalling, by removing all ambiguity from the *red signal*. Whenever that is seen upon that road, it means STOP or DANGER. All other roads could and should give this signal this exclusive meaning. But what can be done to obtain unform signals by motion? The Massachusetts Railroad Commission, a committee of railroad superintendents, the Franklin Institute, and the American Society of Civil Engineers have all made reports and recommendations upon the subject. Can you, or some of your correspondents, tell what can be done that will be effectual?

ARCHIMEDES STEVENSON WATT.

CHICAGO, Feb. 5, 1878.

Inspection of Bridges in Connecticut.

At a meeting of the New Haven (Conn.) Engineering Society, held Jan. 29, the following petition, drafted by Prof. Merriman, was adopted for presentation to the Legislature, to secure the safety of travelers:

To the General Assembly of the State of Connecticut:

The New Haven Engineering Society, feeling that additional legislation is necessary to secure the safety of travelers, respectfully petitions your honorable body to enact laws embodying the following provisions:

1. That the railroad commissioners shall keep at their office a book or books in which they shall record the particulars of their inspections of railroad bridges, such books to be at all times freely accessible to the public; that after having examined any railroad in the manner now provided by law they shall make a record in said books concerning their inspection of each and every bridge and trestle on said railroad; that such record shall give the date and extent of the inspection and the facts thereby observed, a detailed description of all tests employed and of all measurements made, and lastly all the conclusions deduced from said inspection.

2. That the railroad commissioner who is a civil engineer shall make a detailed scientific examination of at least twenty railroad bridges during the year 1878, and of at least thirty in each successive year until all railroad bridges and trestles in the State shall have been thus examined, and shall make a record thereof in a book or books kept at the office of the railroad commissioners, such books to be at all times freely accessible to the public; that such record shall include a collection of facts relating to the past history of the structure, a full description of both substructure and superstructure, with the necessary drawings, a tabulated statement of the dimensions and weights of every part of the superstructure, a statement of the loads which usually pass over it and of the greatest loads which are liable to pass over it, a strain sheet giving maximum strains and the sections of material which actually resist them, a tabulated statement of the maximum strains per square unit in every piece of the superstructure, a detailed account of the quality of the materials and of all defects that may be discovered, a full description of all tests and experiments instituted and of the conclusions therefrom derived, and lastly a concise statement of the results of the examination, said concise statement to form a part of the annual report of the railroad commissioners.

3. That any railroad corporation, before proceeding to build a new bridge or trestle, shall, at least fourteen days previous to the commencement of the erection of the same, file in the office of the railroad commissioners a description of the substructure and of the materials proposed to be employed therein, a complete strain sheet for the superstructure showing maximum strains and the data from which they were computed with the sections of material designed to resist said strains, an elevation and plan of the whole structure, complete working drawings showing the details and dimensions of all the parts, a statement of the calculated weight of the superstructure, a statement concerning the quality and strength of the materials proposed to be used, and a statement of the contract price or estimated cost; that the railroad commissioners shall examine said papers, and if found satisfactory shall, within fourteen days after their receipt, issue a certificate permitting the erection of the structure; that after its completion and before it is opened to public travel, the railroad commissioner, who is a civil engineer, shall subject it to a detailed scientific examination, which shall be recorded as hereinbefore provided, and if found satisfactory shall give a certificate authorizing its use for public travel. And that full particulars concerning any essential repairs or alterations proposed to be made in any railroad bridge or trestle shall likewise be filed with the railroad commissioners and be examined by them as above provided.

Professors Norton and Merriman were selected to advocate the petition before the committee to which it shall be referred. It was also voted that a bill to accompany the petition be drafted. Mr. Mather was appointed to see that this is done.

A Discussion on Lubrication.

[Report of meeting of railroad men and others, held at the rooms of the Master Car Builders' Association, No. 13 Liberty street, New York, Thursday evening, Jan. 17, 1878:]

Owing to the absence of Mr. Garey, Mr. Forney presided and announced that the subject for discussion the present evening would be a continuation of the subject had at the last meeting, namely "Friction, Lubrication and Lubricants." The paper by Mr. F. S. Pease, sent with a request that it be read before the Association at that meeting, as it came to hand too late for that meeting was then read. It was published in full in the *Railroad Gazette* of Jan. 18.

The Chairman having announced that the question was open for discussion, called upon Professor Thurston.

PROFESSOR THURSTON said: There is one point that Mr. Pease makes, and it is something I will be excused for repeating, on account of its being interesting. I do not think it out of the way when he says that the truest economy for consumers is to buy the very best oil, no matter what it costs. As an illustration, we will take two oils, one the best quality of sperm oil and the other a sample of oil which is apparently as good a lubricant as sperm. If you try the sperm on a train of cars and that other oil on another train, you will find in one case that the cost of the oil sinks out of sight if compared with the cost of the difference in the power consumed. Perhaps, when we consider such an illustration, it is better to buy sperm at $1.60 than to buy the other oil at 20 cents; very likely.

In making that comparison I do not mean in some special cases. I remember one oil was so far inferior to the other that the consumer could not afford to use it at 20 cents a gallon where he could the other at $5.00.

There is another thing that has been said in regard to oils, and that is, that the difference in the many oils in the market is not so much in their lubricating properties as it is in their endurance. There are plenty of oils in the market that lubricate as well as sperm, and yet you try the two oils where the work is about the same and you will find in most cases that the second will not have more than one-quarter, sometimes one-half the durability of the sperm.

Mr. Pease says, and many men say the same thing, that the very best test for oil is to try it on the train; but if I used oil on a train for a long time I would not put another oil on if I could find some other good practical way in determining the properties of that oil. If what I had was sufficiently reliable and I found that the new oil would not give a decided advantage, I would not use it; but if the difference was in favor of the new oil I would take my chances and try it, and then I would put it on a slow freight.

Manufacturers have cheaper oil which is as good as sperm in some respects. One of them at one time wanted Mr. Sellers, of Philadelphia, to use his oil to mix in with the good sperm oil: the difference was so great in using that to make the difference all right they should pay Sellers & Co. $50 a gallon to use it. That of course looks extraordinary, but most probably, if you consider the injury done by hot boxes, etc., and estimate its value, the difference you would say was not out of the way.

MR. ATWOOD said: I was once in a factory where we used to use a quantity of sperm oil. I have found that there is a great deal of difference in the sperm we used in that factory. They almost always had hot journals. We got another barrel of different oil, of best quality, which gave satisfaction, and we had no trouble. My experience tells me that there is something in the oil that does that. It is some gummy substance. All such oils will have this gum as the source of trouble, and I am sure such oils are not pure. I think there is great danger from journals if not well cared for, and they require watching. I had charge of a factory, a wheel factory, and in those days the rule was that if you had a two-inch shafting you must have a journal two diameters long. The journal must be the same length as the diameter of the shafting. Now it is just double, and I think it is nearer right.

PROF. THURSTON.—Sellers makes journals for line shafting on that plan.

MR. PARKS.—The only trouble in regard to sperm oil is the probability of its having been mixed. It is given out that a whale is sick every month. A sick whale produces more gluten than the others, which average 40 per cent. If a ship strikes a whale that is sick, and if they have got but part of a cargo and turn in the fresh whale's gluten, it changes the whole lot. In sperm whaling, if they strike a right whale they do not know it, but the captain does when he boils it down and turns it in with the sperm, and when he comes to Nantucket he sends it somewhere, and finally they send it to your factory. Probably you want sperm oil cheaper than that, but they mix the whale oil. Now I do not see why a good sperm oil should gum at all. I do not see how it can be. Blackfish oil is the next lubricant to sperm oil; it is a very good lubricant. Fish-oil can be told by the burning test; it is the best test in the world. You buy two different oils. Take your oil cans, light them and make your test. You can easily tell which is the best oil or the poor oil by the way it crusts the wick. But the only way, as Mr. Pease says, is to go to some reliable dealer with a standing in the business. If they have not the oil you want, they will say so. If you go anywhere else, they have no reputation in the business. At the same time you may have expected to buy a good oil for 19 or 20 cents. It is the way with a good many purchasing agents in the United States. You go to them and they say: "What have you got?" "Well, I have got so and so for 70 cents." Some one else probably has offered him an oil for 69 of a poorer grade, and he insists he can buy the same quality of oil for 69 cents. Of course a dealer does not want to let an intending customer go, so he mixes the oil and sells it.

Professor Thurston probably knows that I can go to-day and mix oil so it cannot be detected. You may say there is some foreign matter in it but you cannot determine what it is.

MR. FORNEY.—I hear that the Harlem Railroad have a way of testing their oil on slides. Can Mr. Garey describe it?

MR. GAREY.—For that matter, gentlemen, it is so simple that I did not say anything about it. All we do is to clean our engine slides and run it in. We time it and see how long it will run. Of course all we can do is simply to make

a comparative test. We take different oils, when we find one oil will run so long and the other so much longer. We can, however, determine one thing by that, which will run the longest. The one that will run the longest will be the one that will gum the most probably. Generally the one that does not gum will heat and be used up faster than the oil that does gum. That is the way we have of testing oil. If it works well we take and buy the oil from the houses furnishing the sample, but sometimes it does not.

MR. FORNEY also called attention to two journal bearings lying before him, which had been sent to him from the Delaware, Lackawanna & Western Railroad with the following note by Mr. S. H. Finch:

"These bearings were originally 1 in. in thickness and were put under a freight car in May, 1872, and in continual service until November, 1877. West Virginia oil with a little 'plumbago grease' was used for lubrication."

MR. FORNEY said: They are cast-iron and, as you will see if you wish to examine, there are two grooves ⅜ in. wide which have been partly filled with some friction metal.

MR. FORNEY then described a method of testing oils which he had seen recently in Baltimore. One thing that struck him very much was the manner of inspecting mineral oils by means of a microscope. The works required a natural oil of a certain gravity and they received a great many samples that were claimed to be of such gravity, but were adulterated with still bottoms, in that way the gravity of the oils being brought to the standard.. In taking a drop of that oil, however, under a microscope a number of black particles were found. He was told it was carbon that had assumed a solid form. There was no mistake in it; if you took pure oil it would appear very different. There was nothing impure in that. Another thing shown was a small lamp, with an arrangement for heating oil. Some pure oil was placed in it and heated to a high temperature; it remained perfectly quiet and it would not take fire. Then an impure oil was tried, and bubbles commenced to form before it reached up to the temperature the other had borne. He did not know the reason, but it occurred to him it might be similar to this: If you take a vessel of pure water and keep it perfectly quiet and heat it gradually, you can heat it to a very high temperature before it commences to boil, but if you put some fine particles of sand in it, it bubbles very soon. Those particles of carbon might similarly be the cause of the bubbling up. There was another method of inspection. The inspector had a piece of iron, say the size of the base of the lamp and ⅛ in. thick, and in that he had drilled different small holes, about ⅜ in. thick. He heated the iron, and the oils were placed in the holes, and those oils that would not stand a high temperature would commence flashing and the good oil would not. Another thing shown was the adulteration of animal oil with mineral oil, and how it could be detected. The inspector took a bottle and put in some oil and shook it, and you could detect it by the bright colors of the bubbles. You can see it in a moment, as animal oils will not produce those bright colors. He told me, further, in detecting animal oils the sense of smell was of great help.

MR. PARKS.—There is another method of testing oils to detect the still bottoms; that is by taking a piece of ordinary blotting paper. Take two different oils, one pure and the other adulterated, put a drop of each oil on the paper and you will see they each make a different showing. One will pass through the paper, leaving it transparent, while the other will leave a dark spot through one-half or one-third the surface. This is the only test we use except tasting. I can tell almost any oil that a person can give me by tasting. I am accustomed to test all oils by tasting.

MR. SMITH said, concerning a lamp that had been sent to the rooms, that it was sent here by the manufacturers, at Rome, N. Y. It is intended for burning lard oil where kerosene is not allowed to be used. It is wound up like clockwork, and is guaranteed to run 15 hours. It was intended to burn without a chimney; it certainly was a nice light.

The meeting then adjourned.

Railroad Reorganization in England.

At the recent half-yearly meeting of the Metropolitan Railway Company in London (Jan. 18), the chairman, Sir Edward Watkin, whose whole life has been spent as an officer of railroad companies and who is now at the head of two or three important companies besides the Metropolitan, introduced his address as follows:

Now, I remember that about ten years ago railway property was in a very difficult position. Even that magnificent concern, the Great Western, had to issue a 6 per cent. stock, to enable the directors to pay their preference and other dividends. The Great Eastern Railway was in the hands of a receiver; the Chatham & Dover, nobody was surprised to find, was in a similar position; and many railways which since then have emerged out of their difficulties were in such a position of distress, financially, that the bailiff and the auctioneer appeared to be very closely at hand. Well, gentlemen, it was under those circumstances in the early part of the year 1867 that the Government of the day introduced a bill which was called the Railway Companies' Arrangements Bill. Well, now, that was a bill intended to facilitate the liquidation of railways on similar principles to those which were adopted in the liquidation of a bankrupt's estate. There were some of us who by the favor of our constituents had seats in the House of Commons, and who were connected with railway property, who thought that what we wanted was not further facilities for liquidation, but further facilities for restoration. (Hear, hear.) I ventured to say, when the present leader of the House of Commons, Sir Stafford Northcote, introduced his bill for the rearrangement of Railway Companies—I ventured to say that the pith and the key of the whole question lay in the protection of the mortgage securities of railways; that that was the core of soundness from which must ultimately and afterwards proceed the restoration of credit; that unless you should protect that part of the property you never could restore your credit, and unless you could restore your credit you must leave everything in a mass of confusion. And I ventured, with the support of other gentlemen in the House of Commons, myself to give notice to introduce a bill for the protection of the railway debenture holder. The result was that those two bills were referred to a Select Committee of Parliament, on which many men, some among us still, and some who have departed, were good enough to serve. It was a tolerably strong committee. There was the present leader of the House or Commons and Chancellor of the Exchequer; there was the Attorney-General, the present Lord Selborne; there was the Solicitor-General, the present Lord Coleridge; there was the late Mr. Thomas Baring, Mr. Kirkman Hodgson, Mr. Wigram Crawford, who was so well and so long known as the respected and influential member for the city of London, and other gentlemen, including three of us connected with railways—my friend and colleague, Mr. Laing, the chairman of the Brighton; Mr. Leeman, the chairman of the Railway Association, and chairman of the Northeastern Railway, and myself. They did me the honor to make me the chairman of that committee, and we elaborated a bill that I have now before me, and I can assure you I often look to this small document with great pleasure, which had for its intention not so much to facilitate the breaking up and winding up of railways, as to enable the shareholder to free himself from those fetters which then existed, and which grandmotherly legislation had placed around his limbs. And, therefore, we went on the principle that we must give more power to the shareholder to help himself, and reduce as far as we could those restrictions which prevented him from taking an independent line of action in defense of his own interests. Well, first of all, therefore, in that bill we prohibited for a time the seizure of the engines and the wagons and carriages of railways, which here and there were being seized for ordinary and common debts. Now, why were they seized? They were seized because railway directors and engineers, having spent sadly too large amounts of capital in different directions, far beyond the Parliamentary powers to raise money which they were able to exercise, had incurred trade debts. In addition to that they had raised money upon a form of security, if it deserved the name, called Lloyd's bonds; and by a decision of Lord Cairns, in the case of the London, Chatham & Dover, it was ruled that the trade debt and the Lloyd's Bond positively came before that security which we had previously thought invulnerable—viz., the debenture debt of a company; and the effect of that decision, and the general distrust and doubt at that time led to this—that positively an Englishman in Sweden wrote me a letter to beg that I would get him the very best price I possibly could for a 5 per cent. debenture of the Southeastern Railway, because he was afraid there was no portion of railway property which was worth holding by prudent men with safety. Well, then, the next provision we obtained was to make arrangements by which railways could be reorganized without sale or bankruptcy. Then we made, for the first time, the railway debenture an invulnerable security. We declared, by clauses, that the railway debenture should be a first charge over all the property of every kind, income included, of the company, save alone for claims for Queen's taxes and for those rent charges upon land accruing, because the land had been bought by a rent-charge instead of by a payment in money. Then we took power to issue debenture stock without that possible limit of 4 per cent. which the general acts of Parliament had inflicted upon us. We then also took power to borrow in advance to meet loans falling due, because the theory before was that on June 30, or on Dec. 31, as the case might be, the man who had the outgoing debenture and the man who had the incoming must, at a particular moment, meet together, and exchange the one thing for the other. Well, then, we got a power—which I believe has saved that now magnificent property, the London, Brighton & South Coast Company—a power to issue shares at discount. Before that you could only issue shares at par; we got a power from the shareholders to issue stock at a discount. Then we got a further power to enable the Board of Trade to authorize the abandonment of needless and useless railways; that bill became the law of the land. Everybody who was a shareholder then can contrast that period with the experience of to-day, and if he looks into the calculation he will see that the measure which a few of us despised railway directors, as sometimes we are considered, managed to pass through a committee—I mean to say he will see that that has raised the value of English railway property at least one hundred millions sterling.

What is Done in a Day by One Railroad.

At the last half-yearly meeting of the Metropolitan Railway Company, which owns the most important part of the London underground lines, being a section 8½ miles long, the following statement of the daily amount of work was made by the Chairman:

I have here a statement showing the number of trains that we run over the system. I find over the main line there are 442 trains in the twenty-four hours, and over the widened lines 568; that makes a total number of trains in the twenty-four hours of 1,010. Well, then, the first engine leaves the shed at a quarter past five in the morning and the last engine arrives at its shed at 1:15. That is on the main line; on the widened lines we are obliged to work during almost the whole of the twenty-four hours of the day. Well, then, we often hear, you know, from the Board of Trade, and other bodies who take what we may call a theoretical interest in railway management, about those precautions for safety which they seem to consider essential—we all consider them desirable—and which they sometimes tell us will of themselves conduce to the safe and efficient working of a railway. Our experience is that the great danger is not so much in the want of some mechanical invention—for, thanks to our great engineers and our practical men, we have made the invention, as regards its working, to a large extent a certainty in its action—the danger arises from the fallible human nature which we have to employ, and from the vast multitude of individual, manual and brain operations that have to be conducted hour by hour, in the management of so complex a system as yours. Well, gentlemen, now I will give you the figures of mere signalling. I find that we make in one day, in the twenty-four hours, 46,826 telegraph bell signals; I find we make 46,826 telegraph train signals; I find that the movements of the signals and the points of levers, that the actual manipulation of levers backwards and forwards comes to 66,958; therefore, in one department alone, the mere signalling and working of your trains upon the block and interlocking system there are 160,000 operations performed every day by human hands, every one of which, of course, might lead to some mistake, which might, more or less, be injurious and damaging.

Transportation in Congress.

In the Senate, Feb. 4, Mr. Spencer, of Alabama, introduced a bill which purposes to incorporate David S. Draper, of Connecticut; John B. Brush and Lyman Elmore, of New York; J. J. Noah, of Tennessee; W. A. Loveland and John Luck, of Colorado; T. L. Kimball and S. H. Clark, of Nebraska; C. A. Broadwater, of Montana; Amasa R. Converse, of Wyoming, and others as a body politic under the title of the National Pacific Railroad and Telegraph Company, with a capital of $35,000,000, to construct and operate railroad and telegraph lines from Cheyenne, *via* Fort Laramie, to Deadwood, and from Fort Laramie, *via* the Yellowstone, to Helena, Montana, and thence to the Pacific Ocean on the coast of Washington Territory. The bill grants the right of way and the use of timber and other materials from the public lands; also the right to issue mortgage bonds to the extent of $25,000 per mile, secured by property of the company, and exempts its property from any and all taxation for 10 years after the completion of the line. The work of construction is to be commenced within one year, and prosecuted at the rate of 50 miles per year until the main line reaches Helena. Authority is given to consolidate or make arrangements with other railroad companies.

Among the incorporators named are the Superintendent and General Passenger Agent of the Union Pacific Railroad.

In the House, on the 4th:

Mr. Sexton, of Indiana, introduced a bill providing that any receiver or other person operating, running, or controling any railroad or other corporation in any of the States of the Union, by authority given by any of the courts of the United States, shall be amenable to the process and judgment of the courts of the several States through which said railroad is being run and operated, or in which said other corporation may be doing business, for any act done or liability incurred subsequent to the order decreeing the appointment of a receiver for such corporation.

The bill agreed upon by the House Committee on Pacific Railroads for the benefit of the Northern Pacific Railroad extends the time for its completion 10 years, and reduces the land grant in Washington Territory, taking away such portion of land as was heretofore embraced in the appropriation for the construction of the road from Pend d'Oreille to Puget Sound.

THE SCRAP HEAP.

(*Continued from page* 74.)

The Electric Light.

The electric light continues to create the greatest interest in Paris. The experiments which we mentioned some time ago have been conducted during forty consecutive days at the Lyons railway station. A force of about 40 horse power is sufficient to keep going twenty-eight electric lamps, each of which gives a light equal to eighty gas lamps, and works with regularity for two and a half hours. The effect is splendid, the whole of the station, excepting the waiting-room, being lighted *a giorno* (like day). The question of economy, however, is not yet settled. It is not known whether the company will agree to pay a somewhat higher price in order to multiply the power of its illumination. These experiments have been tried on Lontain's system, a modification of Wilde's and Siemen's principle. M. Lontain has contrived to send the current, generated by an ordinary Wilde's machine, into an electro-magnetic engine called a distributor. The central part being strongly magnetized by the current from a Wilde's machine, a number of electro-magnets are influenced by its rapid rotation, and in each of these an inductive current is generated. These inductive currents are powerful enough to feed three electric lamps, and as there are two series of twelve magnets a single machine could, theoretically, feed seventy-two lamps. Actually, however, it feeds only twenty-eight. Lontain uses a new regulator, which works very well by the dilatation of a small silver wire. By its dilatation this part of the apparatus works a lever system, and brings the carbon electrodes into contact. The French Northern Railway has purchased a number of Gramme magneto-electric machines. They intend to use them at their terminus for goods and stores.—*Nature.*

Tramps.

The Nashville (Tenn.) *American* says: "As a freight train was passing around the foot of Lookout Mountain into Chattanooga, Saturday, one of the brakemen discovered a tramp in a car-load of mules. The tramp was astride one of the animals, and was asked what he was doing there. 'Driving mules to Chattanooga,' was the laconic response, as he yelled out 'whoa' to the animal. On looking into a car loaded with hogs another tramp was found, perfectly at home with the swine. 'Who are you?' demanded the brakeman, sternly. 'The bell-wether of the flock, leadin' 'em down into the fertile valleys of the Tennessee,' said the tramp, 'and we always ride upon a rail.'"

Flagging a Train the Wrong Way.

On one of the numerous railroads which centre in Minneapolis, a gang of section men found a broken rail the other morning. One of the men, a son of Erin, was told to go on some distance and flag a train that would soon be due, while the remainder of the men with their hand-car ran back to the station to procure another rail with which to repair damages. Pat examined the rail after his companions had gone, and then in a moment of confusion turned the wrong way and followed them back toward the station. He did not discover his mistake until the train he had been intent upon flagging, having safely passed over the broken rail, was thundering at his heels. Frantic over his error, he whipped out his flag, and, waving it wildly at the approaching train, danced up and down the track like a madman. The engineer whistled "down brakes," the train came to a sudden stop, and conductor and engineer rushed forward to ascertain what the trouble was. Pat, still waving his flag, shouted:

"Och! murther and turf! go back wid your thrain! For the love o' hiven run her back three-quarters o' a mile! A rail is bruck entoirely, and sure its flaggin' yez I am till such times as raypairs is made!"

They assured him that if a rail was broken, back there, they had passed over it in safety, and would therefore proceed.

Pat heaved a great sigh of relief as he realized the situation, and exclaimed:

"Thanks be to God! But wasn't it looky I flagged yez, onyhow!"—*St Paul Pioneer Press.*

The Life of Ties Treated with Preserving Substances.

A recent number of the *Annales des Ponts et Chaussees* gives the following information, furnished by the officers of the railroad from Hanover and Cologne to Minden. The proportion of pine ties, injected with zinc, renewed after 21 years, was 21 per cent.; beech ties, injected with creosote, renewed after 22 years, 46 per cent.; oak ties, not injected, after 17 years, 49 per cent.; oak ties, injected with chloride of lime, after 17 years, 20.7 per cent. The ties which were not renewed appeared perfectly sound. Since 1870 the Emperor Ferdinand Northern Railroad has used only oak ties injected with either creosote or with chloride of zinc.

Notes.

An exchange thinks that the telephone will soon be utilized on freight trains, so that the conductor can sit by the stove in the caboose and swear at the brakeman, instead of having to go out on top of the cars in the cold to do it.

A picture of human agony: a bashful young man who climbs out of the upper berth of a sleeping car, at what he supposes to be midnight, to get a drink of water, and when he steps down in the aisle is horrified to see that it is about 9 o'clock a. m., and everybody in the car is up and looking at him pleasantly.—*Burlington Hawk-Eye.*

Some people would like to abolish the practice of smoking tobacco altogether: the Pennsylvania Railroad Company joins them half-way and apparently desires to confine the use of tobacco to small men exclusively. It has lately put in use a number of smoking cars altered from the second-class Centennial cars built last year. They are very good cars in all respects, except that the seats are so close together that no man over five feet three or thereabouts can possibly stow his legs with any degree of comfort, and a half hour's ride will reduce a long-legged man to a pitiable state of cramp and profanity.

Hinkley Locomotive Works.

The Hinkley Locomotive Works last week called a meeting of their creditors, which was held in Boston Feb. 2. The liabilities of the company were stated at $485,396, of which $150,000 is secured by mortgage and $388,774 is in the form of notes. The assets are estimated at $712,619, of which the sum of $387,600 is in real estate; $135,000 in tools and machinery; $100,000 in working stock, and $50,000 in accounts. After hearing the statement the creditors appointed a committee to consider what action had best be taken.

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EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

AN ENGINEERING ARBITER.

The report of the Western Railroad Association for 1877, a part of which was published in the *Railroad Gazette* of Jan. 25, contains a recommendation that no new device or improvement shall be used on the roads represented in that organization, unless drawings and a description of it are first submitted to the superior officers of the company, and through them to the association, to ascertain whether it is patented or patentable or not. Mr. de Funiak, the Superintendent of Machinery of the Louisville & Nashville Railroad, has issued a circular in which this recommendation is put in the form of an order to his subordinates, and railroad officers generally are advised to follow his example. That the preservation of such documents will be very useful, and in other ways, too, besides that for which it is especially intended, there can be little doubt. but probably it will be more difficult to carry out than those who have proposed it seem to think. To do so it will become necessary, on most roads, to increase the force of draftsmen, and on those where none are now employed a drawing department would have to be "organized" with one or more efficient persons to do the work. If the latter is done properly it will require men of very much higher ability and skill than the average which is now found among railroad employes. It may be said, unhesitatingly, that a person who is capable of making drawings which will represent properly even quite simple machines, and then write clear descriptions of them, is a man of a very respectable amount of intelligence and ability. If the possession of the necessary qualifications for such work were required before promotion in railroad service, a very large proportion of the present master mechanics and master car-builders would not be occupying those positions. It is of course true that a person may be very competent for either of these offices, and yet not be able to draw; still, doubtless, he would be better qualified if he had that accomplishment, and to be able to write a clear description of an ordinary machine would seem to be a necessary qualification for every man in charge of either the motive-power or the car department of a railroad of any importance.

Our object, however, is not to point out what master mechanics and car-builders should know, but the sort of ability which will be required to carry out the recommendation of the Western Railroad Association. It seems, at first, like a very simple thing when any one designs a feed water heater, or uses a new kind of axle box, or invents a rail-joint, to have drawings of these made and the devices described; but such records, to be of any value, must be carefully preserved and classified and recorded, without which they would in a great measure be useless. Now to preserve them in this way, they must be placed in the hands of some custodian whose business will be, and who will be responsible for, the preservation of such documents. Any one who is at all familiar with the rapidity with which drawings accumulate, the space which they occupy, and the pains which must be taken to prevent them from being borrowed and thus lost, or of their being torn or misplaced, will know that quite a considerable expense must be incurred merely to provide the conveniences for their proper storage, and that they must then be placed in the keeping of an intelligent person who will be charged with the responsibility of their care. Now all this implies cost and continued expense, which we are very far from thinking would be wasted, but which must be incurred in order to carry out the recommendation which has been made. We have taken occasion several times before to call attention to the Vandal way in which drawings and records are often destroyed. If the recommendation of the Western Railroad Association can do anything to arrest this, and to have the preservation of such documents organized into some effective system, it will accomplish what unfortunately has now been neglected too long. We should, however, feel much more confident of this being done if the difficulties in the way seemed to be more fully realized. It is to be feared that, to accomplish what this Association is aiming at, it will be necessary to bring about some much more radical reforms than are contemplated in the recommendation to the members of that Association to follow what Mr. de Funiak has already done.

The report also contains another suggestion which is now under consideration, and which has been a dream of a good many persons who are directly or indirectly connected with railroads, and has been discussed from time to time in these columns. The suggestion is made as follows:

"That careful experiments should be made with such devices deposited with the Association as committees upon their various classes, appointed at the annual meetings, should direct, under the supervision of a competent and impartial mechanical engineer, whose exclusive services should be fairly compensated and exclusively commanded by the Association." * * * "The opinion of a professional mechanical engineer, especially educated in railway devices, would be of value in almost every case arising, and would make the service of the Association perfect and complete. While the exclusive services of such a person would be of evident value in this regard, we are of opinion that it would hardly be advisable to provide therefor, unless *experimentation and examination to determine the mechanical merits of devices* submitted were also contemplated."

If such a plan could be carried out, that is, if it were possible for an association of railroad men to get some one who would "determine the mechanical merits of devices," it would be one of the most useful adjuncts to promote economical railroad management conceivable, and doubtless this suggestion was prompted by the desire to have more clear and exact knowledge about many things concerning which there is still much ignorance. Experimental investigations, if properly conducted, would no doubt have very great value, and if some authority could be appointed who would determine all disputed points and to whom all questions of doubt could be referred it would be very useful and convenient. But such a person would require to be a sort of mechanical Pope, endowed with engineering infallibility. In other words, the difficulty in carrying out such a project will be to find a person who is sufficiently "competent and impartial" to perform such duties. It is safe to say that such an engineer does not exist, because it would require mechanical omniscience to enable him to make such determination. It would be very much as though an association of doctors should employ some one to make "careful experiments" to determine the value of different remedies for disease. To be able to make experiments and deduce therefrom the laws which govern them requires the highest order of intellectual capacity and training, and some mental or even moral bias or habit may entirely disqualify a person for one kind of investigation while he may be very well fitted for another. An oculist would not be the right person for investigating diseases of the brain, and any specialist in one department of medicine might be very incapable in some other. The same thing is true of engineering. One person might be excellent authority regarding locomotives, and yet if called upon to experiment with electrical signals be utterly incapable of investigating the subject intelligently. A person who has been engaged in laying and constructing frogs and switches might do excellent service in investigating the value of some new invention pertaining thereto, and yet if called upon to report on the endurance and other qualities of paints and varnishes would be quite at sea, and the opinion of a commercial traveler engaged in selling these commodities might be worth more than that of the "competent and impartial" engineer. If the Academy of Design in New York were to appoint an artist to determine the value of colors and methods of painting employed to produce pictures, the art critics the world over would jeer at such an attempt to establish an arbiter in matters which have absorbed the labors of some of the ablest men in the world for centuries.

The proposal of the Western Railroad Association seems to be the result of an inadequate idea of the length and depth and breadth of the science and art of mechanical engineering. Even within the narrow scope of its application to the working of railroads there is so much to learn and to know, that few persons ever attempt to acquire a knowledge of all the branches, and none ever become masters or experts in all. The advancement of the science and art of mechanical engineering has occupied and still occupies the attention of some of the ablest and most brilliant men that have ever lived, and its advancement in the future will be dependent upon the work of the same class of men and not upon that of a single employe who would probably be paid a few thousand dollars per year. No man, however accomplished or able, can be capable of acting as an arbiter to the extent of "determining the mechanical merits of devices submitted." Such judgment as that can only be rendered by the combined wisdom, experience and knowledge of the whole world.

This proposal is criticised freely, because it is believed that, if carried out as suggested, it would not fulfill the purpose for which it was intended, and would end disastrously, whereas there is much work which can only be done by the co-operation of a number of railroads, and which needs to be done very much indeed, and which the Western Railroad Association might have done if a proper method were adopted for doing it.

The outlines of some such plan for the Master Mechanics' and Master Car-Builders' associations were described in an article in the *Railroad Gazette* of March 10, 1876, page 110. The plan is briefly this: Let either of the associations appoint a committee on "experimental research," and let it determine what experiments and investigations are needed and should be made; then let the committee engage one or more of the ablest men acquainted with that special subject, first to report on what is and what is not known, and also what should be known, and indicate the nature of the investigations which would supply the desired knowledge. In that way, instead of employing one person who would inevitably be narrow-minded or ignorant in some directions, the most competent persons in the land could be employed to do such work. At the same time, the expense involved would always be under the immediate control of the committee.

To illustrate how this might be made to work, let it be supposed that the committee should conclude that a thorough investigation of the subject of lubrication, oils, etc., would be valuable. They might then employ such a person as Professor Thurston, associated possibly with some practical master mechanic like Mr. C. R. Peddle. An experimental examination and a report on that subject by two such men, which might cost a few thousand dollars, would, we feel safe in saying, save railroad companies a hundred times its cost, simply by the knowledge and information which it would place in the hands of the people who buy and use lubricants. The Master Mechanics' and Master Car-Builders' associations are to a great extent powerless in doing such work, because its members have no authority to appropriate money for such purposes. If the Eastern and the Western Railroad associations should engage in investigations of this kind, and do it wisely, it would be a new era in the progress and improvement in railroading.

The Illinois Railroad Report.

The report of the Illinois Railroad Commissioners for the year ending with June, 1876, presents the returns of 51 companies, working a total of 15,241½ miles of railroad, 7,433¾ miles of which were within the boundaries of the State of Illinois. The total mileage is less than during the previous year, due probably to the separation of some leased branches out of the State

from some of the companies reporting; but the mileage in Illinois was greater by 148¾, which is an increase of 2 per cent. Illinois has a larger railroad mileage than any other State, though not so large a mileage per square mile as some, and probably a larger population per mile of road than some of the more thinly peopled States, where the railroads have preceded the settlement of the country. Illinois, however, is perhaps the most fully supplied with railroads of all the States. The need for them does not depend wholly upon extent of territory or density of population, but very largely upon the nature of the productive industries. A purely agricultural district of equal extent may be fully supplied—that is, supplied with all the lines which it can support to advantage—with one-half the mileage of Illinois. That State, it is true, long ago ceased to be solely an agricultural community. By the last census only about half of those of its population who pursue occupations for gain were farmers, and the farming population there increases very slowly and in many parts of the State not at all, while there is a rapid growth in the towns. The great growth of industries in Illinois is in manufacturing. Now it is commonly supposed that a much closer net-work of roads is needed for a manufacturing than for a farming community. This, however, depends wholly upon the nature of the manufacturing industries. A country abounding in coal mines and iron ore beds cannot fully develop its resources for iron smelting without a system of transportation fitted to this special industry. A very short distance from the railroad or navigable channel may make the ore or coal wholly unavailable. In such cases the transportation forms a very large proportion of the cost of manufacture and so must be reduced to a minimum. But this is not true of the largest class of manufactures. Usually there is no necessity that a great manufactory of woolen, cotton, agricultural implements, watches or the like should be at one place rather than another. Any station where there is sufficient population and facilities for distribution will usually do. In New England, it is true, the distribution of the manfactures, begun before the days of railroads, was largely determined by the opportunities for obtaining water power. But this never could be true to anything like that extent in a State like Illinois, and this influence has now much less than its old effect, even in New England, where the steam factories at the seaboard now find no difficulty in competing with the water mills of the interior. Now for such industries as these a comparatively small railroad system suffices just as well as a larger one. The factories are established where there are towns and consequently supplies of labor, and where there is a route by which raw materials may be received and manufactured products marketed. Illinois has a vast number of coal mines, and some of the newer roads were constructed purposely to distribute their products, or rather to help distribute them, as there are comparatively few of them which did not have some outlet, or could not have got one by the construction of short spurs, through the older railroads. It has also important iron industries (few blast furnaces but several rolling mills), but these are all where railroad facilities have abounded for many years. Its chief growth in manufactures has been in branches which do not largely depend upon close connections with mines, and can be established at almost any railroad station where workmen can be had.

Bearing this in mind, there is perhaps a greater oversupply of railroads in Illinois than in another State, and fewer opportunities for the profitable establishments of new lines, except perhaps light, cheap ones, which may thrive with half the average amount of traffic.

Of the 7,433¾ miles of railroad in the State at the end of June last, about 60 miles were not in operation—the Chicago, Millington & Western and the Grayville & Mattoon roads.

The 51 companies had on their 15,241 miles of road 3,319 locomotives (1 to 4.57 miles), 1,449 passenger cars (1 to 9.6 miles), 608 baggage, mail and express cars, 43,076 box and stock cars (2.84 per mile), and 20,162 coal and flat cars (1.33 per mile). The total number of cars is 65,295, or 4.34 per mile of road, and 19.7 cars per locomotive.

The stock and debts by which this property is represented were as follows:

	Total.	Per mile.
Preferred stock	$59,414,768	$3,899
Common stock	251,375,559	16,494
Funded debt	268,164,230	17,595
Floating debt	6,793,310	446
Total	$585,747,867	$38,434

The cost of construction per mile reported for different roads varies from $80,736 for the Pittsburgh, Fort Wayne & Chicago to $8,032 for the Havana, Rantoul & Eastern (3 ft. gauge).

The work reported for this system of roads (15,173 miles in operation) was:

Train mileage—	Total.	Per mile of road.
Passenger	22,197,892	1,413
Freight and mixed	48,050,401	3,165
Construction	5,312,419	350
Total	75,560,712	4,928
Tons carried	26,475,136	.....
Tonnage mileage	4,867,023,023	320,109
Passengers carried	20,394,027	.....
Passenger mileage	1,377,673,439	98,798

The mileage of revenue trains was equivalent to 6.25 trains each way daily for 365 days in the year—1.92 passenger and 4.33 freight and mixed—a frequent service.

The traffic is also quite heavy—larger, for instance, than on the average German road, if we may trust the statistics. The traffic per mile of road compares as follows with that of the system of the German Railroad Union in 1875, which includes substantially all the German, Austrian, Hungarian and Roumanian roads, and some of the Dutch and Belgian lines:

Per mile of road per day each way—	Illinois.	German Union.
Passenger miles	135.3	158.5
Ton miles	438.5	302.4

That is, the average German road had 17 per cent. more passenger traffic than the average Illinois road, but the average Illinois road had 45 per cent. more freight traffic than the average German road, and counting a passenger equivalent to two tons of freight the Illinois road has nearly one-sixth the most traffic.

This result seems somewhat surprising, but the Illinois average is greatly increased by the presence of several lines of enormous traffic which have but a very few miles of road in the State—especially the Michigan Central, the Lake Shore & Michigan Southern, and the Pittsburgh, Fort Wayne & Chicago.

The figures for train mileage and traffic indicate an average passenger-train load of 62 persons and an average freight-train load of 104½ tons.

In full car-loads the traffic would amount to about 2¾ cars of passengers and 44 of freight each way daily, which shows very plainly to how small an extent the capacity of the roads is drawn upon.

About 28 per cent. of all the freight carried was grain and flour; 17½ per cent. was coal, 11¼ lumber, and 8¾ per cent. live stock.

The earnings of the roads reporting were:

	Total.	Per mile.
Passenger	$24,941,709	$1,644
Freight	74,788,925	4,929
Other	4,604,226	303
Total	$104,334,870	$6,876
Working expenses	61,885,652	4,078
Net earnings	$42,449,218	$2,798

These net earnings are equivalent to 7 per cent. on a capital of $40,000 per mile, which is more than the actual capital reported.

The gross earnings per mile are about equal to the average of United States railroads. They are, however, 37 per cent. less than the average earnings per mile of the German railroads, the latter's being $10,925 against $6,876 on the Illinois roads, though the latter, as we have seen, do one-sixth the most work.

Dividends were paid during the year by nine of the 51 companies reporting, amounting in the aggregate to $7,806,793, or $513 per mile of road for the whole 15,241 miles. The average rate on the entire stock outstanding was 2.5 per cent.

The amount paid for interest on bonds was $15,530,711, which is equivalent to 5¾ per cent. As the average rate of interest is not less than 7 per cent., this is due to the non-payment of interest on many millions of the bonds outstanding. All the roads which declared dividends have a terminus in Chicago, with the exception of the 15-miles long Illinois & St. Louis Railroad between East St. Louis and Belleville, which includes the earnings from its mines in its income.

Ten of the roads reporting did not have earnings enough to cover their working expenses and taxes. These ten have together about 875 miles of road. The number of men employed on these 15,171 miles of road was 61,272, or at the rate of 4.03 per mile of road.

The Commissioners complain of a lack of promptness in making reports, and still more of incompleteness in the returns. As yet we have not received the part of the report that contains the reports of the seperate companies and the tables in which they are combined, but we know that heretofore the statistics have been made almost worthless by such lack of completeness, for which the companies are to blame; though the form for the report itself is so imperfect that complete returns would have but a moderate value. The chief complaint made, however, is the neglect to return the salaries of the officers, which is the matter of least importance for the public to know. The Commissioners report that they have begun no new suits for the enforcement of the law prohibiting charges higher than the tariffs of "reasonable maximum rates" which were established in accordance with the law of 1873. They await the decision of the United States Supreme Court, before which the question of the constitutionality of that law is now pending. They say, however, that it is their purpose, should the law be sustained by this court, to ask the managers of the railroads of the States to meet with them to confer on the subject of transportation rates, in order that information may be gained which will make possible "an intelligent revision of the schedules."

Baggage-Car Traffic.

The publication at this time of a few papers on this subject suggests an inquiry into the general neglect of this branch of business in this country and the lack of any well established system of conducting it for pay. The free baggage transportation is probably more successfully conducted here than anywhere else in the world with greater certainty and less trouble to the passengers.

It seems to us that the lack of provision for a paying baggage traffic is due to the fact that the methods prevalent in America have left comparatively little of it. The great bulk of the traffic carried in passenger trains, aside from passenger baggage, has been turned over to the express companies to manage, they having established their business, offices, and in many cases their routes, and gained a reputation for conducting the business promptly and safely, before great connected lines of railroads were constructed, and long before they would have been capable of the co-operative effort which would have been required of them in doing what we call an express business.

In Europe without exception, we believe, the railroad companies conduct their own express business, and naturally they have provided at the same time for all the other traffic which goes in their passenger trains, be it extra baggage or other. Indeed, especially in Germany, the care taken to make sure that nothing goes free which ought to pay is sometimes exasperating to the passenger, the employes weighing every piece of baggage, even if evidently far within the limit prescribed, and making out receipts and signing and asking for declarations of value, and otherwise compelling the reflection that no value is placed upon time at the station, however it may be on the train. But there and elsewhere in Europe a considerable revenue is obtained from the freight on passenger trains, aside from what we would call express business, and the passengers' baggage, which there as here goes free, with limitation of weight to 55 lbs. in Germany and 66 lbs. in France, instead of 100 lbs. as here, which limitation is enforced there but not at all strictly here.

This general custom of giving the passenger the option of taking with him a certain amount of freight (for that is what it amounts to) without charge is hard to account for or justify on any equitable principle. If I go from New York to Chicago I have the privilege of taking with me on the fastest train, without charge, a quantity of goods which by the slow freight trains would be charged a dollar, and by express is worth at least twice as much; but if I do not happen to have the baggage, then my privilege counts me for nothing. This is not a work which can be done, without cost. The addition of weight to fast passenger trains is a cause of additional difficulty and expense in running them, to say nothing of the manipulation of the baggage itself and its insurance. A rational regulation would seem to require those to pay for the service to whom the service was rendered. As it is, the young man with a box of paper collars for baggage is forced to pay part of the cost of carrying Miss Millions' Saratoga trunk.

However, it is the custom, and a pretty solidly established one, and spreading rather than otherwise; for some years ago one of the standing complaints against German railroads was that they made you pay extra for baggage, and now most of the time-tables in the guides are accompanied by the announcement "50 pounds [55 of our pounds] of baggage will be taken free."

What is called the "parcels traffic" in England, which would be nearly all express traffic here, is often an enormous business in Europe, and, as nearly as we can learn, it is carried there at much less than express rates in this country. This is certainly true on the Continent, where rates are so low for small packages sent short distances that suburban residents and the like are much less tempted than here to take into the cars with them a varied assortment of market gardening, butchers' meat, packages of dry-goods, and the like. Usually these packages are delivered by the railroad companies at the residences of the consignees, just as is done by the express companies here. This is certainly a great convenience to the passengers, but the

rates are such as to lead one to suspect that the advantage is altogether on the side of the shipper and not at all on that of the railroad company. Such things are done in Europe as well as in this country. Accurate estimates of the cost of a service do not always precede and fix the establishment of the prices for it, and there is there more than here that species of passion for regularity and apparent equality which here appears occasionally in demands for a "pro rata" tariff of rates; that is, there is not likely to be sufficient difference between the rates for very short and those for long distances.

Probably one of the chief reasons why few efforts have been made to develop new kinds of paying baggage-car traffic has been the position of the express companies. They have certain rights by their contracts, and they have the only efficient machinery, usually, for collecting and delivering traffic at stations, which is indispensable to many kinds of the traffic moved by passenger trains. But on the other hand, the express companies do not do business on all the passenger trains of any road, and there is often traffic which can be had for one train and not for another, this being especially the case with suburban trains, as our contributor points out in the course of his articles.

Doubtless at this time there would be no difficulty in organizing and conducting an express business among the railroad companies without the intervention of the express companies. There is, however, no present prospect that this will be done. The express companies are on the ground, have their business completely organized, and certainly do their work very efficiently, and the question cannot be judged as it could be if the machinery had to be created anew to do a new work. In the latter case, probably, the railroad companies would manage their express traffic directly, with some incidental advantages, besides the greater profit, if it should be greater; but it is always difficult to change old perfected measures even for a plan which in time might be made better, and often it is not desirable to do so. If the express companies are getting too great privileges of the roads, or of some of them, this can be remedied as contracts expire. There may be a competition for the privilege and the road can, if it will, usually secure about all that it is worth. There have been, however, two or three instances recently in this country where the railroads have undertaken their own express business, and where their managers have asserted the practicability and advisability of the general adoption of this plan. As we said above, however, there is no present indication that this policy will become general.

But though the field for profit from freight carried directly by the railroad companies on their passenger trains is thus greatly limited, that is no reason why it should be abandoned entirely, or so neglected as to make its chief effect the demoralization of the baggagemen. It should be made the most of, both for the profit of the roads and the accommodation of the community.

The Erie Litigation.

It is a delicate matter for a newspaper to attempt to pass judgment on cases which are pending before the courts. These latter are the most efficient machinery that the community has been able to contrive for ascertaining facts, deciding controversies and doing justice. Before them all the evidence of both sides is likely to be produced, and they are the experts to decide on the admissibility of evidence. We shall not, then, assume to decide on the merits of the numerous cases recently brought against the management of the Erie Railway. But there are certain circumstances connected with the cases which lead one to form a judgment or at least a suspicion of the animus of the proceedings, and these deserve the consideration of the parties directly interested and of that much larger class in this country who look at the case chiefly as it affects the reputations of the officers of the Erie Company.

Some of these we noted last week, and among them the fact that every case, or nearly every one, seems traceable directly or indirectly to one man, and he not interested to any considerable extent in the Erie Railway, but largely interested in another enterprise which he has sought to advance at the expense of the Erie. His plans have not been carried out by the present Erie management, and if the reorganization takes place as now planned, they never will be carried out.

Moreover, the Erie Company has large claims against this man, whether just ones or not we will not say, for which its present management is prosecuting him. It is evidently greatly to his interest to secure a change in the management that will be favorable to him before there is a reorganization. If he can dictate the management for a short time, as he has done heretofore more than once, he can relieve himself of the possibility at least of large losses.

Further, if the purpose is solely to obtain a full and satisfactory accounting and investigation of the acts and policy of the management under the receiver, it seems strange that it should be found necessary to bring such an avalanche of suits, in so many courts at once, all under one man's inspiration, apparently. It is easy to understand that a vast deal of trouble can be caused to the management by the necessity of defending half a dozen suits at once, and it is also intelligible that a bad impression may be created among the distant English proprietors by the news that within a week or two numerous suits were brought by various persons on the ground against their trustee and manager, charging mismanagement, deception, corruption and even perjury. And we cannot help seeing that the whole conduct of the affair in bringing these suits was well fitted, if it was not purposely designed, to cause trouble to the management and suspicion among the stock and bondholders who have adhered to the reorganization scheme.

And the complaints, in some of the cases at least, and especially in the prosecution of the Receiver for perjury, do not diminish this suspicion as to the animus of the suits. It is hard to see how this prosecution can be called anything less than shameful. It is reasonable enough that one should be surprised to find no mention made of past-due coupons in the report made to the State Engineer and Surveyor, or to find that all the interest that accrued, including that which was not paid, was given under the head of "payments" for interest on bonds. But no living man could ever have supposed that there was any intention to deceive in such a form of accounts, the facts in the case being the best known of the circumstances of the company; while the testimony of those longest familiar with the official interpretation of this form of report shows that the Erie report was made in accordance with that interpretation. It would not have been strange if it had not been, for this form is fatally imperfect in some respects, and ambiguous in several; and if it is a crime to make a report to the State Engineer and Surveyor which does not give an adequate idea of the financial condition of a company, then all New York railroad managers who report must go to jail. The form is prescribed by law, and it is imperfect.

And, further, the "expert" accountants, on whose information some of the charges were made, have not helped to convince us that the suits were brought in good faith. Some of their testimony indicates either that they only sought for a pretext for a charge or that they know very little of railroad accounts. Such testimony as gives the total receipts of a railroad company as its "earnings" hardly comes from experts in railroad accounts.

The cases are all still before the courts, and we do not pretend to pass on their merits—if they have any; we only trace some of the indications that something other than the nominal object of the suits has been aimed at in bringing them in this way.

The Efforts to Maintain Rates.

The result of the Brevoort House conference of the trunk line managers on Wednesday of last week was very satisfactory; the proposal to leave the division of Boston business between the Grand Trunk and the other lines to the arbitration of Mr. Albert Fink was promptly accepted by the Grand Trunk and the Vermont Central, with expressions of great satisfaction, and also an agreement to restore Boston rates on the 1st inst. pending the arbitrator's decision. It has been reported that some shipments have been taken at reduced rates since that time, but we have no complaints of such action from the railroad companies, and if true the shipments were probably in accordance with contracts previously made. The addition of the Grand Trunk to the combination, or rather the establishment of a Boston combination including the Grand Trunk, very greatly strengthens the New York apportionment, and increases the prospect of permanently maintaining west-bound rates. These rates have been unduly low for a long time, considering the nature of the freight, and scarcely any interest will suffer by maintaining them at least as high as they have been since the apportionment went into effect. It is true that trouble at Boston would not necessarily or even probably destroy the New York apportionment; but it would for the time defeat its main object, which is the maintenance of regular, uniform and profitable rates. If the Boston trouble had not been settled, probably rates on all freight out of New York, Philadelphia and Baltimore would have been reduced one-half, or nearly as much, and the whole profit on this business sacrificed until an agreement could be made. Now the business out of New York alone is estimated to bring in about $10,000,000 a year, so that by this trouble concerning a comparatively small traffic, the reasonable profits of sundry roads would have been reduced at the rate of some five millions a year, unless they could have made it up by increased charges on east-bound and local traffic.

Now all the railroads whose competition is of importance at all the leading sea-board cities are (or will be as soon as the Boston plan is perfected) parties to apportionment schemes by which they are likely to reap so great advantages that they will be loath to forfeit them by breaking rates at points where traffic is not divided, that is, at Philadelphia and Baltimore.

But at an evening meeting held the same day, and too late to be reported in these columns last week, action was taken concerning the east-bound traffic which may have more important results than can be attained by any agreement on west-bound business. The east-bound business has been more or less irregular about two months, and as the business is enormous, the losses by the reductions below the regular rates, or the rates that could have been obtained without reducing the traffic, must have been very great. All the while there has existed an agreement to maintain rates and a regulation for enforcing that agreement; and yet apparently not one step has been taken toward doing what all parties had expressly agreed to do and were all the time expressing their willingness to do. The machine is there, apparently in perfect order, supposed to be effective, but it has never been set in motion.

Now at the meeting last week it was agreed to appoint an executive committee of representatives of the four trunk lines with Mr. Fink as the executive officer, which shall hear complaints as to cutting by the Western connections of these roads. The enforcement of the penalty by charging local rates to the offending connections is to be left to the Commissioner, Mr. Fink. He went to meet the representatives of the Western roads in Chicago last Wednesday, with Commissioner Guilford, to endeavor to bring about an immediate restoration of east-bound rates. The final result of this meeting we cannot report this week; but if no agreement among the Western roads is effected, then it will be time to try the plan for enforcing the maintenance of agreed rates.

This business is an extremely complicated one, but it is usually easier to maintain rates on it than on the west-bound business, for the reason that there is more of the time a full demand for cars to go east. And the circumstances at present, one would suppose, are exceptionally favorable to the maintenance of east-bound rates. There has scarcely ever before been so heavy a movement of grain and provisions to the sea-board in the winter, and it seems really surprising that the question has not settled itself for the present.

In order to make the existing agreement effective, however, the Grand Trunk should be a party to it, as we believe it is not. Otherwise, the roads cut off by the Baltimore & Ohio, the Pennsylvania and the Erie might find an outlet by the Grand Trunk and concentrate all their traffic on it.

It is remarkable that these recent agreements have been to a great extent brought about and depend largely for their completion on one man—Mr. Albert Fink—in whose capacity, integrity and impartiality the railroad managers have learned to place implicit trust. And the success so far had, and perhaps the failures still more, indicate that the first requisite of any combination of the kind which is in the least degree complicated, is a central executive officer, the agent of all the companies and interested in none, through whom business may be conducted, and who may be fully informed of the interests of each party to the agreement.

The Worst Year for Earnings.

We publish this week a table of earnings and net earnings of the railroads which have thus far reported for the year ending with September, 1877, similiar to the table for the calendar year which we are accustomed to compile a few months later. We make this table partly because there are a large number of important railroads, including all those of New York and Massachusetts and most of those in the other New England States, which report for the year ending with September and do not report for the calendar year, and partly because the year ending with September, 1877, was nearly co-incident with the period of greatest depression in recent railroad history—on many lines a period of light traffic and low rates at once.

Our table has returns from 64 railroads, with 11,391 miles of road, which was something more than one-seventh of the total in operation in the United States that year. Forty of these roads are in New York and New England, and in the other 24 are included nearly all the Maryland and Virginia roads. It is thus peculiarly a table of Eastern railroads. Less than a thousand miles of the total belong to Western companies. It would be fairly representative of

the Eastern railroads but for the absence from it of the Pennsylvania railroads.

It is also notable as including three of the four great trunk lines, which are always excluded from our table for the calendar year. Taking together the 64 roads with their 11,391 miles of road, the results of the year's business show as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Miles	11,391	11,246	Inc... 145	1.3
Gross earn....	$103,448,493	$109,607,053	Dec...$6,158,560	5.6
Expenses.....	67,306,495	71,965,043	Dec... 4,658,548	6.5
Net earnings.	$36,141,998	$37,642,010	Dec. 1,500,012	4.0
P. c. of exp's...	65.06	65.66		

Thus with an increase of 1.3 per cent. in mileage the profits of the roads fell off 4 per cent., the expenses having been reduced more in proportion than the earnings.

Per mile of road the figures are:

	1877.	1876.	Decrease.	P. c.
Gross earnings	$9,082	$9,746	$664	6.8
Expenses	5,910	6,399	489	7.6
Net earnings	$3,172	$3,347	$175	5.2

These roads have nearly one-half more than the average earnings of railroads in the United States, four of them, as will be seen by running down the column of "gross earnings per mile" in the table, having taken in more than $20,000 per mile even in this most unfavorable year.

While several of these roads, including all the trunk lines, are profiting greatly by the heavier traffic and better rates since the last harvest, many of the Eastern roads will be much slower than the Western roads to feel the improvement resulting from heavy crops. They more than almost any roads in the country reflect the average prosperity of the country, as their traffic is largely in merchandise and manufactures for which the whole United States is the market. There is every reason to believe, however, that, taken as a whole, the railroads included in this table passed their time of most unsatisfactory business, for the present at least, during the year last reported, and that the current year will show greatly improved results.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads, as follows:

Havana, Rantoul & Eastern.—Extended from Alvin, Ill., east by south to West Lebanon, Ind., 12 miles. It is of 3-ft gauge.

THE NEW YORK GRAIN RECEIPTS last January ought to have been satisfactory. They were 238½ per cent. greater than for the corresponding month last year, which, however, was an unfavorable month, the roads being greatly obstructed by snow. The chief increase is made by the New York Central route, by which the receipts were *eight times as great* as last year; the Erie, however, doubled its receipts, and there was an increase of nearly a quarter in grain receipts by the Pennsylvania, which is balanced, however, by a decrease in flour receipts by that route.

The proportions of grain received by the three routes in the two years were:

	1878.	1877.
New York Central	63.8	26.8
Erie	25.1	42.4
Pennsylvania	11.1	30.8
Total	100.0	100.0

The extraordinarily large receipts by the New York Central this year will be noted. It is adduced by its competitors as evidence that the Western connections of this road have led the way in cutting rates. It should be observed, however, that the comparison with last year is likely to be misleading. In January, 1877, the New York Central suffered more than any of its competitors by the snow blockade. Ordinarily the New York Central brings more grain to New York than any other railroad, though sometimes the Erie brings more in a month. But the Central's proportion this year is unusually large. As far as regards the grain movement over the Pennsylvania Railroad, little can be judged from its deliveries at New York. Its deliveries of grain are chiefly at Philadelphia and Baltimore, and there has been a very large increase there this winter as well as at New York.

RUSSIAN RAILROAD TRAFFIC has been terribly disturbed for more than a year by the necessities of the army. This of itself enormously increased traffic, which was further swelled by the exceptionally great harvest of last summer, and the greater distances that the grain had to be hauled in order to reach the markets, due to the closing of the Black Sea. The complaints of the Russian public have been so great that the Government has deemed it proper to publish an explanation of the efforts made to provide for the necessities of the time. According to this at the beginning of the war the Government ordered 200 locomotives and 3,000 cars for the four railroads chiefly used by the army; then considerable permanent improvements had to be made to provide for the increase in number of trains; other orders for rolling stock were given, and up to the first of October last 228 locomotives and 4,834 cars had been added to the equipment of the Russian roads, and orders have been given which by next summer will bring up the total of these additions to 644 locomotives and 14,312 cars. The increase so far has not nearly sufficed, though this is probably more due to the confusion on the roads supplying the army than to the lack of rolling stock. But about the beginning of this year there were 29,000 car-loads at interior stations awaiting a chance for shipment. Freight traffic has been blocked on the Odessa Railroad nearly eighteen months, and the most important business firms there have petitioned the Government to introduce some regulation of the military trains that will make possible the resumption of freight shipments, the long interruption of which were threatening ruin.

HOG PACKING was heavier last January probably than ever before in that month. The season (beginning with November) opened with a lighter movement than last year, but a recovery was soon made, and at the end of January the estimated number packed was as great as for the entire season (one month longer) last year. In Chicago alone about 800,000 hogs were packed in January, and during the three months then ending it had disposed of 1,850,000, which is 34 per cent. more than last year, and more than three times the number packed in Cincinnati during the same three months, the latter city ranking next to Chicago as a packing centre. Of the 5,100,000 head estimated to have been packed for market in the whole Northwest, 70 per cent. were packed in six cities, and 36 per cent. at Chicago, 11 per cent. at Cincinnati, 8½ at St. Louis, 5½ at Louisville, 5¼ at Milwaukee and 4¼ at Indianapolis.

This business gives a very large traffic for the railroads, both in hogs carried to the packing centres and in hog products distributed there, the latter bearing long transportation, and a very large part going to Europe, while the domestic consumption of the Northwestern products extends from Maine to Florida, and even to the Pacific coast. This hog and provision traffic has usually been the most important item in the winter business of the railroads in many parts of the country; but the winter grain movement will this year exceed it in bulk. Provisions are not held for shipment by lake, as grain is, though there are usually considerable shipments by lake—and rail—that is by propellers to Buffalo and Erie and thence east by rail.

THE WESTERN RAILROAD ASSOCIATION in its recent report recommended strongly the preservation of evidence of all improvements made by the employes of railroads as a precaution against the danger of being compelled to pay for patents on them taken out by others than the inventors. About the time this recommendation was written in Chicago, M. Michael Chevalier, one of the most eminent of living economists, was relating a practice similar to that recommended, in his lectures at the College de France. He said that M. Schneider, the founder of the great works at Creuzot, was accustomed to take out patents "for the slightest improvements introduced in his processes by his employes, not for the purpose of preventing others from making use of the same processes, but to avoid the trouble which might be caused him by people who might demand payment of him for inventions for which he was indebted solely to the intelligence of his assistants." This was used as an illustration by M. Chevelier in an argument against granting patents in any way.

THE BRITISH IRON TRADE continues in an extremely depressed condition, and there is talk of the necessity of further reductions in wages to enable the iron-masters to keep their works going. Out of 974 blast furnaces existing in the United Kingdom, only 489, or just about one-half, were in blast at the close of 1877. The manufacture of steel, however, there as here, has been comparatively prosperous. During the first 11 months of 1877, out of 382,640 tons of rails exported, 217,426 tons, or 57 per cent., were steel, against 161,388 tons of steel exported during the corresponding 11 months of 1876. These exportations go largely to the outlying countries of the world, where the railroads have a light traffic, and feel the least need of a specially durable material. This is accounted for by the closer approximation of the prices of steel and iron which we find reported in *Capital and Labor* as $25 and $20 per ton—a much greater difference than has been given by some authorities, and lower prices than we have seen quoted before anywhere.

THE WINTER GRAIN MOVEMENT for the eight weeks, from Dec. 1 to Jan. 26 has been as follows, for five years, the figures being for bushels of grain of all kinds, but not including flour:

The receipts at the eight leading Northwestern markets were:

1878.	1877.	1876.	1875.	1874.
20,844,648	18,499,353	18,804,387	12,303,466	23,016,803

The shipments of these same markets were:

1878.	1877.	1876.	1875.	1874.
11,264,496	8,151,224	8,253,810	5,740,856	10,936,494

The receipts at the seven Atlantic ports were:

1878.	1877.	1876.	1875.	1874.
24,756,929	14,400,623	13,869,383	11,832,486	14,651,805

The business of the last week reported is the largest of the whole winter, except in Northwestern receipts, which were exceeded the previous week.

OCEAN FREIGHT RATES, which we have not quoted since the closing of navigation on the lakes and canals, have been tolerably stable so far this winter, some of the time higher than when we quoted last fall, but rarely or never lower. Last Tuesday engagements were reported by steam from New York to Liverpool at 9d. per bushel for grain and ¼d. per pound for cotton. It is interesting to note that at the same time contracts were made for cotton by sail from New Orleans to Liverpool at just *four times* the rate from New York by sail: the latter was quoted at $\frac{1}{16}$d. per pound, the former at $\frac{1}{64}$d. As the mouth of the Mississippi is now wide open, this difference in rates must be charged to something else than the difficulty of getting over the bar.

THE JAPANESE RAILROADS seem to have abundant earnings, but their expenses are extraordinary considering the cheapness of labor and the accessibility of sea-ports through which all foreign supplies can be had cheaply. The line from the treaty port, Yokohama, to the chief city, Tokio, which is 18 miles long, over a perfectly flat country, earned in 1875 about $24,000 per mile and expended $19,800; and the line from Kotoe to Osaka, 20 miles, earned $12,600 per mile at an expense of $12,500. Japan has planned a considerable system of railroads, and if they are executed as cheaply as our American lines, and worked with decent economy, these examples would indicate that they, or some of them, might be made to yield excellent returns.

THE COMPOUND LOCOMOTIVE introduced into France about a year ago, and described and illustrated recently in these pages, has been discussed at great length by the Paris Society of Civil Engineers. At the first session of the Society in 1878 it was announced that the French Academy of Sciences had granted the Fourneyron prize for 1877 to Mr. Mallet, the inventor of this locomotive.

THE UTILIZATION OF PRISONERS OF WAR takes place on the Russian railroads by a recent order of the Minister of Transportation, who directs that the railroad companies shall employ Turkish prisoners for clearing snow from the tracks and on earthworks, and has ordered the officers in charge of prisoners to fill the railroads' requisitions for them.

Defaulting and Bankrupt Companies in 1877.

We continue this week our notes on this numerous class of railroad companies. The second heading under which they may be arranged is:

II. NEW DEFAULTS.

The new defaults of the year were not many in number, although they include several important companies, and two especially which have paid regular dividends within a comparatively short time, and which were considered sound and prosperous. These defaults may be subdivided into two classes, simple failures to pay interest, and what may be called defaults by arrangement, that is, cases where companies have ceased to pay their interest, or a part of it, by agreement with their bondholders. This class includes only two companies, but in it is the Philadelphia & Reading, which is now paying only one-half the interest on a large part of its debt and issuing scrip for the balance.

As nearly as can be ascertained, the whole amount of bonded debt upon which default was made during the year (including only one-half the amount of the Reading bonds) was $68,189,000. In 1876 new defaults were made on only about $17,000,000 of bonds, in 1875 on $144,942,600; in 1874 on $265,366,700, and in 1873 on $243,973,750. Up to Jan. 1, 1876, the *Commercial and Financial Chronicle* estimated that the total amount of railroad securities on which default had been made was $788,967,750, and the additions of the last two years increase this amount to about $890,000,000. A very large part, probably more than half this amount, has since been settled by foreclosure or by agreement with creditors.

The simple defaults of the year were as follows:

Ashtabula, Youngstown & Pittsburgh.—Default was made on the coupons due Oct. 1, 1877. The road extends from Youngstown, O., to Ashtabula, 62.6 miles, and by the latest report the company had outstanding $1,500,000 first, and $400,000 second-mortgage bonds. The road has been leased since its completion by the Pennsylvania Company, the lessee guaranteeing the interest up to Jan. 1, 1877, after which it was expected that the net earnings would pay the interest. They proved insufficient, however, and default was made. The bondholders have appointed a committee.

Atlantic & Gulf.—This company defaulted Jan. 1, 1877, on its $1,666,000 consolidated bonds. In March John Screven and S. A. Strang were appointed Receivers by the United States Circuit Court in a suit begun by the bondholders. Interest continues to be paid on the $1,400,000 prior sectional bonds.

Central, of New Jersey.—This company was put in the hands of a receiver in February, on application of the floating-debt creditors and stockholders. In May default was made on the $20,000,000 consolidated mortgage, but interest is paid on the $5,000,000 first-mortgage and some other bonds. Negotiations for a reorganization are in progress.

Chicago & Iowa.—This company failed to pay the coupons due July 1 on what are known as the second series of its 8 per cent. first-mortgage bonds, which amount to $1,150,000, the first series, on which interest is paid, being $600,000. The road is 80 miles long. The trustees took prompt action, and Wm. H. Holcomb was appointed Receiver in August. The road reported, for 1876, net earnings of $192,828, or more than $52,000 in excess of the interest, and some occasional monthly reports published this year indicate an increase of earnings.

Cincinnati, Hamilton & Indianapolis.—The coupons due Jan. 1, 1878, on this company's bonds were not paid. The bonds are guaranteed by the Cincinnati, Hamilton & Dayton, and that company holds $654,000 out of a total issue of $2,500,000. Negotiations for a settlement have been begun.

Cincinnati, Sandusky & Cleveland.—In March Rush R. Sloane, formerly President of this company and a defaulter, endeavored to secure possession of the road again and succeeded in having James D. Lea appointed Receiver in his interest by a local court. After some months' legal skirmishing John S. Farlow, President of the company, was appointed Receiver by the United States Circuit Court on application of the bondholders, and took possession of the road June 14. In consequence of these complications default was made June 1 on the coupons then due on the $1,072,000 consolidated or second-mortgage bonds.

Connecticut Valley.—Default was made Jan. 1, 1877, on the coupons of the $1,000,000 first-mortgage bonds. These coupons were afterwards paid, but the July coupons are still unpaid, and the bondholders have taken action to foreclose. The road is now in the hands of the trustee under a second mortgage for $1,200,000.

Denver & Rio Grande.—This company defaulted on the

coupons due May 1, and asked its bondholders to fund three coupons in ten-year certificates. The company owns 307 miles of narrow-gauge road, the bonded debt upon which, by the latest accessible report, was $6,140,000. The trustees began a suit soon after default was made, but no further proceedings are reported. The company built 36 miles of road during the year.

Little Rock & Fort Smith.—The bonds of this company, which was organized in 1875, after foreclosure of a former mortgage, began to draw interest Jan. 1, 1877. In July, however, the company asked the holders to fund four coupons, the earnings of the road not being sufficient to meet the accruing interest. There are $2,200,000 bonds outstanding.

Long Island.—This company made default Oct. 1 on the coupons of the $250,000 bonds of the leased New York & Rockaway, and those of the $600,000 bonds of the Smithtown & Port Jefferson road. These coupons, however, have since been paid, although the company itself has been put in the hands of a receiver, under proceedings begun by the floating debt creditors.

Marietta & Cincinnati.—This road was placed in the hands of a receiver (John King, Jr., President of the company and Vice-President of the Baltimore & Ohio) June 27, on an allegation of default on the fourth-mortgage bonds, which are all held by the Baltimore & Ohio, and on which probably no interest was ever paid by the Marietta & Cincinnati Company. We believe default has since been made on the second and third-mortgage bonds.

Missouri Pacific.—This company defaulted Oct. 1 on the interest due on tha $500,000 Carondelet Branch bonds, which are a first lien on 15½ miles of that branch, from Kirkwood, Mo., to Carondelet. It has lately been stated that a compromise has been agreed upon with the bondholders, who agree to surrender their bonds and accept new bonds for one-half the amount, the company to pay the accrued interest, and to agree to pay coupons on the new bonds promptly as they accrue.

Ohio & Mississippi.—This company was placed in the hands of a receiver in November, 1876. Default was then made on the second-mortgage bonds, and a further default on the first-mortgage bonds was made Jan. 1, 1876. The coupons then due were paid in November last. The July coupons are now being paid, but the coupons of Jan. 1, 1878, are still unpaid.

Portland & Ogdensburg, Vermont Division.—In October default was made in the interest on the preferred first-mortgage bonds issued to complete the road. The authorized issue of these bonds was $500,000, but we are not certain as to the amount actually disposed of. Receivers were appointed shortly after, the trustees taking prompt action. A long litigation is probable, some of the first-mortgage bondholders, who did not consent to the creation of the preferred mortgage, having taken steps to enforce their claims.

Portsmouth, Great Falls & Conway.—The *Eastern Railroad Company*, which leases this road, declined to pay the December coupons on $486,000 outstanding bonds, on account of a doubt as to the legal authority of the board to make such payment. The Eastern Company has deposited the amount of the coupons in trust, pending the decision of the Massachusetts Supreme Court as to the legality of the payment.

Savannah, Skidaway & Seaboard.—This Company, which owns a short suburban line out of Savannah, defaulted on the coupons due Jan. 1, 1877. The bondholders subsequently agreed to extend the time of payment of three coupons.

DEFAULTS BY ARRANGEMENT.

Evansville, Terre Haute & Chicago.—It was stated at the time that this Company only paid $15 on each coupon due May 1, and asked the bondholders to fund the remaining $20. This proposal seems to have been generally accepted, as no further action is reported. The company has $750,000 first-mortgage bonds outstanding on 54½ miles of road, and had always met its obligations promptly up to that time.

Philadelphia & Reading.—Early in the year this company concluded an arrangement by which the holders agreed to accept one-half cash and one-half scrip for three years on $19,686,000 general mortgage bonds and $1,125,000 Perkiomen Railroad bonds; scrip for five years on $1,138,300 debenture loan, $10,527,000 convertible bonds and $2,571,000 canal bonds. The company also funds for five years in scrip the interest on $1,731,000 Philadelphia & Reading Coal & Iron Company bonds and the annual interest and dividends ($868,270) due as rental on the Schuylkill Navigation Company's property.

III. PROGRESS TOWARDS SETTLEMENT.

The list below is not intended to include all the companies in whose cases proceedings looking towards settlement are going on, but merely to note in the briefest possible way the changes of importance which may have occurred during the year, such as commencement of suits, appointment of receivers, decrees of foreclosure or similar matters. The companies included are as follows:

Alexandria & Washington.—About the close of the year the sale of this road was ordered by the Virginia Circuit Court in a suit against the company of several years' standing. It is to be sold Feb. 16.

Anderson, Lebanon & St. Louis.—About the close of the year Mr. L. A. Millbank, President of the company, was appointed Receiver by the United States Circuit Court, on application of the creditors.

Ashuelot.—In April it was decreed that the trustees, who have held the road for several years, should surrender it to the company on payment of $145,750 due the Cheshire Railroad Company, which had worked it for the trustees. The road was subsequently leased by the stockholders to the Connecticut River Railroad Company.

Atchison & Nebraska.—An agreement has been concluded by which this company is to be reorganized. The $3,750,000 old bonds and $1,425,000 unpaid coupons are to be exchanged for $1,125,000 new bonds and $3,337,000 stock. The road can, it is believed, pay interest on the amount of new bonds.

Atlantic & Great Western.—The only movement of importance in the case of this road has been some litigation to prevent the completion of the agreement to extend the time of payment of the Ohio first-mortgage bonds. This agreement was approved by the Ohio Court, but not by the New York Supreme Court.

Atlantic, Mississippi & Ohio.—Authority has been given by the Court to extend the time of payment of certain of the underlying divisional bonds. It is said that the English holders of the consolidated bonds have agreed upon a plan of reorganization.

Atlantic & North Carolina.—A suit has been begun to foreclose the first mortgage of $200,000 on this road. The United States Circuit Court declined to appoint a receiver, holding it unnecessary.

Atlantic, Tennessee & Ohio.—This road was to have been sold in April to satisfy some judgments, but an arrangement was made by which the North Carolina Company assumed their payment, acquiring in return a controlling interest in the road.

Billerica & Bedford.—This Company, having completed a road of two-feet gauge from Billerica, Mass., to Bedford, found itself disabled by a floating debt, and lately filed a petition in bankruptcy.

Cairo & St. Louis.—In December the United States Trust Company, trustee, began suit to foreclose the mortgage on this road, and the Court appointed H. W. Smithers, Receiver. No interest had been paid for several years. By the last report it did not earn its working expenses and taxes.

Canada Southern.—An agreement has been concluded by which the old bonds of this Company and its leased lines are to be exchanged for new bonds bearing 3 per cent. interest for three years and 5 per cent. thereafter, the New York Central to guarantee the interest for 20 years. This agreement is now being carried out.

Chesapeake & Ohio.—A final decree of foreclosure has been granted by the Virginia Circuit Court, under which the road is to be sold April 2. It is stated that the agreement of reorganization has been accepted by a large majority of the bondholders.

Chicago, Dubuque & Minnesota.—Arrangements have been completed for the transfer of this road and the *Chicago Clinton & Dubuque* to new companies organized by the bondholders. The new companies are to be consolidated as the Chicago, Clinton, Dubuque & Minnesota.

Chicago & Lake Huron.—In July a decree of foreclosure was granted under the mortgage of the old Port Huron & Lake Michigan Company. Some of the bondholders took an appeal to the United States Supreme Court and secured an order vacating the decree and directing the filing of an amended bill of foreclosure, in order that certain rights claimed by the company in the Chicago & Northeastern road, from Flint to Lansing, may be fully presented and passed upon.

Chicago, Millington & Western.—A suit has been begun to foreclose the mortgage on this unfinished narrow-gauge road, and a receiver was appointed. The road has never been worked, except to haul gravel to Chicago.

Chicago & Paducah.—Mr. E. Ellery was appointed Receiver, May 27, by the Illinois Circuit Court, on application of the officers of the road. Shortly before this Mr. Hinckley, a director and former President of the Company, was arrested on a charge of defrauding the bondholders, but the case has never been brought to trial.

Chicago, Pekin & Southwestern.—A receiver was appointed in May by the Illinois Circuit Court, on application of the United States Rolling Stock Company. Subsequently a foreclosure suit was begun by the trustee. Near the close of the year both suits were transferred to the United States Circuit Court, but have since been remanded to the State Court.

Chicago & Southern.—A suit was begun in April to foreclose the mortgage on this short road, which was built to give the Chicago, Danville & Vincennes an entrance into Chicago. A receiver was then appointed. We believe the road is not operated at present.

Chicago & Southwestern.—A decree of foreclosure on the *Atchison Branch* (which was not included in the sale of the road in 1876) has been sued out by Mr. T. C. A. M. Von Weel, the holder of a single bond. A receiver was appointed. The road is to be sold to satisfy the mortgage for $1,000,000.

Cincinnati, Wabash & Michigan.—The trustees under the first mortgage took possession of this road in the interest of the bondholders, Jan. 3, 1878. The company asked bondholders to fund their coupons in January, 1876, and has paid some interest since on a part of the bonds.

Cleveland & Newburg.—A decree of foreclosure of the mortgage on this short suburban road out of Cleveland, O., was granted in April.

Connecticut Western.—In June this road was transferred to the bondholders, under an agreement by which they accepted preferred stock for their bonds, the bonds to be held

RAILROAD EARNINGS AND NET EARNINGS.

Fiscal Year ending September 30.

Name of Road.	Mileage.		Gross Earnings.		Per cent. of Expenses.		Net Earnings.		Gross Earnings per Mile.		Net Earnings per Mile.	
	1877.	1876.	1877.	1876.	1877.	1876.	1877.	1876.	1877.	1876.	1877.	1876.
Albany & Susquehanna	177	177	$1,161,127	$1,309,921	61.45	68.54	$447,547	$412,164	$6,562	$7,403	$2,529	$2,329
Atlantic, Mississippi & Ohio	428	428	1,791,579	1,742,251	66.47	68.98	600,633	540,539	4,186	4,072	1,403	1,263
Baltimore & Ohio	1,466	1,422	13,208,860	15,031,236	62.27	63.93	4,982,805	5,421,380	9,036	10,570	3,399	3,813
Boston & Albany	317	317	6,762,148	7,074,758	67.95	66.19	2,167,102	2,391,764	21,313	22,298	6,830	7,538
Boston, Barre & Gardner	53	53	150,433	158,476	93.63	76.00	9,979	37,974	2,893	3,019	188	716
Boston, Clinton, Fitchburg & New Bedford	151	151	1,032,733	1,073,358	77.83	72.26	228,721	298,036	6,839	7,085	1,510	1,967
Boston & Lowell	83	83	1,137,769	1,127,891	69.41	72.00	348,007	315,861	13,718	13,599	4,196	3,808
" & Maine	201	201	2,267,019	2,370,620	70.84	67.96	660,964	759,453	11,236	11,781	3,285	3,774
" & New York Air-Line	50	50	214,825	167,991	64.50	77.26	76,263	38,192	4,297	3,359	1,525	764
" & Providence	67	67	1,373,362	1,467,760	74.59	71.50	348,985	418,309	20,640	22,058	5,245	6,287
" Revere Beach & Lynn	9	9	115,072	119,990	76.82	61.00	26,734	46,786	13,076	13,835	3,038	5,317
Charlotte, Columbia & Augusta	195	195	497,157	524,563	59.27	61.24	202,489	203,328	2,550	2,690	1,038	1,043
Chesapeake & Ohio	435	433	1,702,533	1,599,513	80.07	77.72	339,308	356,477	3,925	3,695	782	824
Chippewa Falls & Western	11	11	28,019	31,844	51.02	45.03	13,733	17,526	2,712	3,081	1,325	1,695
Connecticut River	66	56	573,303	589,537	64.81	64.84	201,831	207,267	8,686	10,556	3,110	3,711
" Valley	47	47	181,327	268,842	67.45	94.91	59,020	13,693	3,900	5,781	1,269	294
" Western	67	67	227,942	318,287	74.27	65.30	58,650	110,641	3,417	4,751	875	1,651
Cumberland Valley	82	82	519,851	547,994	46.00	45.60	280,677	298,101	6,340	6,683	3,423	3,636
" " leased lines	43	43	47,975	52,157	78.46	71.92	10,313	14,760	1,116	1,213	240	343
Danbury & Norwalk	34	34	165,245	173,478	69.58	53.20	50,275	81,368	4,889	5,132	1,479	2,390
Eastern	282	282	2,508,108	2,470,971	68.13	72.33	799,317	683,594	8,895	8,755	2,835	2,424
Erie	957	957	15,436,559	16,539,765	74.70	76.53	3,905,035	3,881,545	15,846	17,008	3,960	3,780
Fitchburg	152	152	1,920,414	1,846,969	71.01	72.00	556,738	517,131	12,625	12,142	3,660	3,399
Galena & Southern Wisconsin	30	30	18,690	20,658	67.50	62.96	6,068	7,625	623	688	202	254
Green Bay and Minnesota	247	247	330,794	306,272	89.95	92.99	33,071	21,454	1,339	1,240	134	87
Harlem Extension	113	113	269,960	293,678	106.31	74.80	*17,071	73,814	2,477	2,599	...	653
Hartford, Providence & Fishkill	123	123	897,645	950,744	75.94	80.42	215,939	185,996	7,287	7,730	1,756	1,512
Housatonic	126	126	589,407	656,544	60.18	62.74	234,970	244,634	4,659	5,190	1,857	1,934
Mineral Point	51	51	121,538	115,710	69.05	77.55	37,636	25,987	2,383	2,269	738	510
Mississippi & Tennessee	100	100	433,440	469,272	50.92	48.48	212,768	241,798	4,334	4,693	2,128	2,418
Naugatuck	57	57	503,667	501,005	58.75	58.91	207,759	206,085	8,836	8,800	3,645	3,616
New Canaan	8	8	15,464	18,466	87.56	72.80	1,924	5,026	1,863	2,285	241	628
New Haven & Derby	13	13	97,676	89,437	48.98	64.80	49,835	31,489	7,514	6,880	3,833	2,422
" " & Northampton	108	108	564,367	570,397	62.57	68.34	211,447	180,582	5,226	5,267	1,958	1,668
New London Northern	100	100	537,384	508,902	65.14	68.40	187,312	160,620	5,374	5,089	1,873	1,606
New York & Canada	149	149	389,610	370,961	70.00	70.00	116,883	111,288	2,616	2,490	785	747
" " Central & Hud. River	1,000	1,000	26,579,086	28,046,588	56.23	57.49	11,632,924	11,922,416	26,579	28,047	11,633	11,922
" " & New England	139	139	1,010,337	1,000,482	76.28	73.71	239,652	263,012	7,267	7,198	1,724	1,892
" " N. Haven & Hartford	153	153	3,954,060	4,314,682	56.20	59.66	1,731,683	1,740,621	25,793	28,145	11,296	11,354
" " & Oswego Midland	293	371	568,204	535,845	93.31	90.83	38,039	49,146	1,943	1,444	130	132
" " Providence & Boston	63	63	853,697	1,065,228	57.95	56.34	358,997	465,202	13,659	17,044	5,744	7,443
Northeastern (South Carolina)	102	102	320,071	382,279	60.00	57.66	128,033	161,844	3,141	3,748	1,255	1,587
North Carolina	223	223	467,996	492,339	65.09	64.27	163,385	175,902	2,099	2,208	733	789
Northwestern North Carolina	29	29	33,971	38,776	55.74	49.63	15,018	19,530	1,171	1,337	518	673
Norwich & Worcester	66	66	717,013	738,670	56.48	58.90	312,057	311,965	10,798	11,426	4,700	4,698
Old Colony	287	275	2,208,032	2,206,880	65.86	66.91	753,879	730,353	7,698	8,091	2,628	2,678
Providence & Springfield	23	23	88,939	86,568	51.74	52.45	42,924	41,159	3,901	3,797	1,883	1,805
" & Worcester	67	67	910,011	899,105	72.45	74.31	250,675	230,981	13,603	13,452	3,750	3,456
Rensselaer & Saratoga	182	182	1,451,762	1,626,783	64.90	64.50	509,632	577,596	7,982	8,945	2,802	3,176
Richmond & Danville	198	198	909,317	937,198	67.85	53.24	292,591	438,232	4,593	4,741	1,478	2,217
" Fred'ksb'g & Potomac	83	83	317,398	367,970	55.77	50.54	140,593	181,985	3,824	4,433	1,694	2,193
" & Petersburg	25	25	137,116	137,407	65.58	56.27	47,271	60,095	5,430	5,442	1,872	2,380
Rome, Watert'wn & Ogdensb'rg	409	380	1,255,271	1,221,727	72.68	77.30	343,137	277,574	3,069	2,987	839	679
Shepaug	32	32	49,079	40,601	72.53	72.60	13,538	11,127	1,520	1,258	423	348
Shore Line	50	50	342,375	379,571	85.43	68.67	49,869	118,927	6,847	7,591	997	2,379
Springfield, Athol & Northeast'n	49	49	97,749	100,623	73.52	64.80	25,694	35,469	2,015	2,075	530	731
Utica & Black River	170	165	463,299	491,571	70.36	58.46	229,983	204,199	2,725	2,979	1,353	1,238
Washington & Ohio	52	52	96,399	101,640	71.94	62.15	27,048	38,473	1,863	1,964	523	743
Western Maryland	97	95	332,086	311,903	66.23	69.11	112,145	96,346	3,424	3,255	1,156	1,005
Wilm'gton, Col'mbia & Augusta	189	189	518,226	532,311	83.09	78.12	87,631	116,634	2,742	2,816	464	617
Wilmington & Weldon	179	179	548,462	604,699	62.10	60.48	208,354	238,977	3,064	3,378	1,164	1,335
Wisconsin Central	450	355	718,743	709,936	64.55	58.06	254,830	297,734	1,598	2,000	566	839
" Valley	89	89	177,908	188,889	60.79	61.27	69,764	73,087	1,999	2,121	784	821
Worcester & Nashua	94	70	528,884	545,966	64.27	63.14	188,905	201,237	5,626	7,807	2,010	2,878
Total, 64 roads	11,391	11,246	103,448,493	109,607,053	65.06	65.66	36,141,998	37,642,010	$9,082	$9,746	$3,172	$3,347
		Inc. 1.3 p.c	Dec. 5.6 p. c.				Dec. 4.0 p. c.		Dec. 6.8 p.c		Dec. 5.2 p.c	

* Deficit.

by the trustees as security for the execution of the agreement. The arrangement has been accepted by the holders of most of the $3,000,000 bonds.

Covington, Columbus & Black Hills.—In September application was made by some creditors for the appointment of a receiver. The United States Circuit Court denied the application, but enjoined the company from disposing of its property, and directed reports to be made to the Court.

Covington, Flemingsburg & Pound Gap.—This Kentucky road, which has only six miles of track laid, was put in the hands of a receiver in August on application of a number of the floating debt creditors.

Danville, Hazleton & Wilkesbarre.—Late in the year the bondholders began a suit to foreclose the first mortgage. The suit is defended by the company and by S. P. Kase, a large owner in the property. The road is worked by the Pennsylvania Railroad Company.

Detroit & Milwaukee.—Proceedings in the case of this road have been delayed by the failure of the English and American bondholders to agree upon a plan of reorganization, the English holders desiring to transfer the road to the Great Western Company. It is said that that company now controls a majority of the first mortgage bonds and will proceed to complete the foreclosure, if no terms can be made.

Erie.—Late in the year a final decree of foreclosure was granted under which the road was to have been sold Jan. 21, 1878. The English plan of reorganization had been accepted by a majority of the security-holders and arrangements made for the reorganization of a new company. A number of suits were begun near the end of the year by James McHenry and others for the purpose of preventing the carrying out of this plan, and they have been so far successful as to cause the postponement of the sale for two months.

European & North American.—The bondholders of the Maine section have instructed the trustees to foreclose the land-grant mortgage. The bondholders of the New Brunswick section have made arrangements to reorganize as soon as some necessary legislation can be procured.

Florida Central.—The sale of this road by the State of Florida was enjoined by the United States Courts and in June the road was restored to the company after it had been reorganized under the direction of the Court. The company has since been enjoined from making a proposed issue of new bonds.

Green Bay & Minnesota.—Since the close of the year a receiver has been appointed on application of the bondholders, who have for several years been funding the coupons on the $3,200,000 first-mortgage bonds.

Hannibal & St. Joseph.—On Oct. 17 the Missouri Circuit Court appointed Mr. S. McWilliams Receiver on application of a stockholder who charged mismanagement by the company. The Receiver held possession but a few days, however, when the Supreme Court reversed the action of the Circuit and restored possession of the road to the company. At the annual meeting soon after there was a complete change of management. No default has been made in interest, although it is known that the September coupons were paid with borrowed money.

Harlem Extension.—In July the title to the 57 miles of this road from Rutland, Vt., to Bennington was decided to be in the Vanderbilt Estate, under the so-called Park-Baxter mortgage of 1867 for $500,000. The holders of these bonds soon afterwards organized the Bennington & Rutland Company and took possession. The 59 miles from Bennington, Vt., to Chatham, N. Y., were not operated for some time, but are now worked by the bondholders as the Lebanon Springs road, the former name of that section.

Houston & Texas Central.—In March an application was made for the appointment of a receiver by some of the stockholders and other parties who held claims for about $1,465,000 for money advanced. After some litigation the suit was withdrawn. A controlling interest in the stock was at the same time transferred to Mr. Charles Morgan, of New Orleans. An arrangement was afterward made by which most of the floating debt (said to be about $3,000,000) was extended for ten years. No default on the bonds has been made, though it was announced that the July coupons were not paid by the company, but purchased for account of Mr. Morgan.

Indianapolis, Bloomington & Western.—In August, the United States Circuit Court granted a decree of foreclosure of the first mortgage on the Main Line, the amount of principal and interest due being specified at $6,240,858. No sale has been had, and no plan of reorganization has been agreed upon, we believe.

Iron Mountain, Chester & Eastern.—In April the United States Circuit Court granted a decree of foreclosure and sale, to satisfy the $660,000 bonds outstanding on the 41 miles of completed road from Chester, Ill., to Tamaroa. An attempt was afterward made to secure possession of the road through the action of a State court, but it was not successful

Jacksonville, Pensacola & Mobile.—The sale of this road by the State of Florida was enjoined temporarily at the suit of the Western North Carolina Railroad Company, Western Division, to recover certain money claimed to have been advanced. In August a new suit was begun by holders of Florida State bonds issued in aid of the road, and in this suit the United States Circuit Court appointed Mr. Calvin H. Allen Receiver. He is now in possession of the road.

Kansas City, St. Joseph & Council Bluffs.—Early in the year a plan of reorganization without foreclosure was adopted, which has been accepted by most of the bondholders and is now being carried out. The plan provides for the issue of $5,000,000 new bonds and $2,500,000 preferred stock in exchange for the old bonds and notes and accrued interest. The old bonds amounted to $6,909,000, and the floating debt to $1,307,300.

Kansas Pacific.—This road remains in the hands of the Receivers. Late in the year the Court authorized a payment to those bondholders who did not fund their coupons in 1874, of an amount sufficient to equalize them with those who did so and afterwards received a part of the interest.

Lafayette, Muncie & Bloomington.—In May an attempt was made by the bondholders to take possession of the Western Division from Lafayette, Ind., to the State line. They were resisted by the company and the case was finally carried to the United States Circuit Court, which appointed Gen. George H. Chapman Receiver of the whole road.

Lake Erie, Alliance & Wheeling.—About the close of the year this unfinished narrow-gauge road was seized under judgments for debt and is soon to be sold at sheriff's sale.

Manhattan & Northwestern.—Early in the year President Elliott was appointed Receiver of this unfinished Kansas road, on application of some of the creditors.

New York & Oswego Midland.—The sale of this road under the decree granted by the United States Circuit Court, which was to have been had early in the year, has been postponed from time to time pending the appeal taken to the United States Supreme Court against a part of the decree which provides for the payment of the Receivers' certificates as a prior lien on the property.

Painesville & Youngstown.—In February suit was begun by the Union Trust Company, Trustee, to foreclose the first mortgage, under which about $1,000,000 bonds have been issued.

Paris & Danville.—In July an agreement was reached by the various interests among the creditors, and arrangements are being made to foreclose the mortgage.

Petersburg.—In January application for the appointment of a receiver was made by the creditors, and refused. In May, however, it was renewed, and the Court decided to grant it, appointing Capt. R. G. Pegram, formerly President of the company.

Portland & Ogdensburg.—A large majority of the bondholders have agreed to the company's proposition to fund four coupons. The agreement provides for the withdrawal of the foreclosure suit.

Port Royal.—The sale of this road, under the decree granted in 1876, has been postponed on account of the legal complications arising from the intervention in the suit of the Georgia Railroad Company, which guaranteed some of the bonds. Late in the year application was made to set aside the stay of sale.

St. Louis, Iron Mountain & Southern.—Application for a receiver made by some of the bondholders was argued before the United States Circuit Court near the end of May and refused. A new suit has been since begun. The company paid no interest from April till October, except on the old St. Louis & Iron Mountain first-mortgage bonds, the August coupons on which were paid near the end of that month, but since October has made some partial payments of the interest due.

St. Paul & Pacific.—Late in the year an offer was made by a party of capitalists in Canada and Minnesota to buy up the bonds of this company at an agreed price. The offer was accepted by a majority of the bondholders, but the arrangement has not been completed. The road is still in possession of the trustees.

Savannah & Memphis.—In November this road was placed in the hands of receivers, on application of the bondholders, who had received no interest for several years.

Selma & Gulf.—A decree of foreclosure having been granted against this Alabama road, it was offered for sale in November, but no bids were made and the sale was adjourned.

Southern, of Long Island.—In October application was made for a receiver by the holders of a judgment obtained by Conrad Poppenhusen for money advanced. The New York Supreme Court appointed Col. Thomas R. Sharpe (Receiver of the Long Island Railroad also) Receiver. The road continues to be worked under the lease to the Long Island.

Springfield & Northwestern.—In August a decree of foreclosure was granted by the United States Circuit Court, under which the road was to have been sold in December, but the sale was postponed at the request of the bondholders.

Toledo, Peoria & Warsaw.—A plan of reorganization has been accepted by a majority of the bondholders, and, in accordance with this plan, new suits have been begun to foreclose the first mortgages on the Eastern and Western Divisions and the Burlington Branch.

Vermont Central.—An important change in the position of the creditors has been made by a decision of the Vermont Supreme Court denying the petition of the Central Vermont Company for leave to sell the road to satisfy the trust debt. The decision was only on the petition directly, but incidentally it settles the position of the so-called trust debt as inferior to the Vermont Central mortgage debt and the Vermont & Canada claim for rental. Proceedings have been begun to settle more clearly the disputed points.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Union Pacific, annual meeting, at the office, No. 42 Equitable Building, Boston, March 6, at 10 a. m. Transfer books will close Feb. 23.

Wabash, annual meeting, at the office in Toledo, O., Feb. 20, at 10 a. m. Transfer books closed Feb. 1.

Dividends.

Dividends have been declared as follows:

New York, Providence & Boston, the usual quarterly dividend of 2½ per cent., payable Feb. 11.

North Pennsylvania, 2 per cent., semi-annual, payable in scrip, Feb. 25. The scrip will bear no interest, and will be convertible into stock in sums of $50, or multiples thereof.

North Carolina (leased to Richmond & Danville), the usual annual dividend of 6 per cent., payable one-half at once, the balance in March next.

Columbus & Hocking Valley, the usual semi-annual dividend of 4 per cent., payable Feb. 11.

Pullman Palace Car Co., the usual quarterly dividend of 2 per cent.

Cleveland & Pittsburgh (leased to Pennsylvania Company), the usual quarterly dividend of 1¾ per cent., payable March 1.

Foreclosure Sales.

The *Reading Branch* of the *Wilmington & Reading* road was sold in Philadelphia, Jan. 29, under a decree of the United States Circuit Court. The sale included about seven miles of road, from Birdsboro, Pa., to Poplar Neck, near Reading, and the right of the Wilmington & Reading Railroad Company to a lease made in 1874 by the Berks County Railroad Company to the said Wilmington & Reading Company. The property was sold subject to a mortgage made in 1874, and was bought for $6,000. The main line of the road was sold two years ago, and reorganized as the Wilmington & Northern, and the purchasers of the branch are understood to have been stockholders in that company.

The sale of the *Springfield & Northwestern* road has been again postponed from Feb. 6 to Feb. 23, by order of the Court.

ELECTIONS AND APPOINTMENTS.

Boston, Barre & Gardner.—Mr. Samuel W. Manning has been appointed General Passenger Agent, with office at Worcester, Mass.

Buffalo, Syracuse & Albany.—The first board of directors of this new company is as follows: D. S. Bennett, Buffalo, N. Y.; Burt Van Horn, Lockport, N. Y.; Henry L. Fish, Rochester, N. Y.; Alfred Wilkinson, Syracuse, N. Y.; T. H. Stryker, Rome, N. Y.; Addison Day, Utica, N. Y.; J. D. Featherstonehaugh, Schenectady, N. Y.; Cheney Ames, Oswego, N. Y.; S. H. Sweet, Albany, N. Y.; Charles Ely, New York; Edward Appleton, Edward Crane, F. E. Frothingham, Boston.

Chicago & Paducah.—Mr. B. T. Lewis is appointed General Ticket Agent, in place of A. Pickard, resigned. Office in Chicago.

Chicago, Pekin & Southwestern.—Mr. B. T. Lewis is appointed General Ticket Agent, in place of A. Pickard, resigned. Office in Chicago.

Chicago, Rock Island & Pacific.—Mr. J. T. Sanford has been appointed General Freight Agent, in place of Mr. Lewis Viele, resigned. Mr. Sanford has been for some time General Eastern Agent of the road.

Cincinnati, Sandusky & Cleveland.—Mr. B. J. Gregg has been appointed Master Mechanic. His office is in Sandusky, Ohio.

Columbus & Miami Valley.—The board of directors has elected David Sesler, President; John G. Clemens, Vice-President; M. C. Adams, Secretary.

Dallas, Palestine & Southeast Texas.—At a meeting held in Dallas, Texas, Jan. 18, the following directors were chosen: S. B. Buckner, J. E. Schneider, R. V. Tompkins, Alex. Sanger, W. H. Gaston, W. C. Conner, J. D. Crawford. The following officers were elected: President, General S. B. Buckner, of Louisville, Ky.; Vice-President, Julius E. Schneider; Treasurer, Samuel J. Adams; Secretary, W. S. J. Duncan.

Davenport, Buffalo & Blue Grass.—The officers of this new company are as follows: President, W. C. Brewster; Vice-President, W. L. Clark; Secretary, S. F. Smith; Treasurer, Wm. Renwick; Attorney, W. H. Gabbert; General Agent, J. M. Davies. Offices at Davenport, Iowa.

Davenport, Le Claire & Princeton.—The officers of this new company are: President, W. C. Brewster; Vice-President, Dr. James Gamble; Secretary, Edward Russell; Treasurer, S. F. Smith; General Agent, J. M. Davies. Offices at Davenport, Iowa.

Delaware, Lackawanna & Western.—Mr. J. W. Baker has been appointed Master Car Builder of the Morris & Essex Division, in place of L. S. Barber, deceased.

Fitchburg.—At the annual meeting in Boston, Jan. 29, the old board was re-elected, as follows: Wm. B. Stearns, Seth Bemis, Robert Codman, Rodney Wallace, C. U. Cotting.

Galveston, Houston & Henderson.—At the annual meeting in Galveston, Tex., Jan. 22, the old board was re-elected, as follows: John Sealy, R. S. Hayes, T. W. Pierce, H. M. Hoxie, J. H. Hutchings, E. S. Wood, N. B. Yard, A. P. Lufkin, J. A. Baker, D. S. H. Smith, Ira H. Evans. The board then met and re-elected the following officers: President, John Sealy; Vice-President and Manager, H. M. Hoxie; Secretary, F. P. Killeen; Treasurer, J. H. Hutchings.

Grayville & Mattoon.—The United States Circuit Court has appointed J. D. Herkimer Receiver.

Green Bay & Minnesota.—Mr. Timothy Case has been appointed Receiver, on application of the bondholders. Mr. Case was appointed General Manager of the road a short time since.

Hannibal & St. Joseph.—It is reported that Mr. J. B. Carson has been offered the position of General Superintendent of this road. Mr. Carson is now General Manager of the Blue Line.

Illinois & St. Louis Bridge.—Mr. C. Shaler Smith has been appointed Consulting Engineer, and will have his office in St. Louis. Mr. Smith will still retain his connection with the Baltimore Bridge Company.

Indianapolis & St. Louis.—The following appointments have been made in consequence of the termination of the contract between this company and the Terre Haute & Indianapolis: E. B. McClure, General Superintendent, Indianapolis; John C. Noyes, General Freight Agent, St. Louis; C. C. Cobb, General Passenger Agent, St. Louis. Mr. McClure's position is unchanged; Mr. Noyes was General Freight Agent and Mr. Cobb Assistant General Passenger Agent of the joint roads.

Keokuk & Des Moines.—Mr. R. W. Maguire has been appointed Paymaster. Mr. J. L. Obertop is appointed Car Accountant.

New York State Superintendent of Public Works.—Mr. Benjamin S. W. Clark has been nominated by the Governor of New York, and confirmed by the Senate as Superintendent of Public Works. He will have the charge and control of the State canals, heretofore managed by the Canal Board. Mr. Clark is a merchant of Malone, N. Y., and has held no public office except as Inspector of Prisons and lately as Warden of Sing Sing Prison, in which position he is said to have shown remarkable ability. Mr. Clark was the third candidate nominated by the Governor, the Senate having rejected the two previous ones.

Ohio State Inspector of Bridges.—Railroad Commissioner Bell, of Ohio, has appointed Michael Haviland Inspector of Bridges, in place of Wm. S. Williams, removed. Mr. Williams has held the position for three terms, under three dif-

ferent commissioners, and was a civil engineer of experience.

Pennsylvania.—Mr. George C. McGregor has been appointed Principal Assistant Engineer of Maintenance of Way of the Pennsylvania Railroad Division. He has been on the road for some years, and is a graduate of the Rensselaer Polytechnic Institute at Troy, N. Y.

Mr. J. K. Shoemaker has been appointed Passenger Agent Middle District, with office in Harrisburg, Pa.

Philadelphia & Atlantic City.—Mr. Charles R. Colwell has been chosen President, in place of Wm. Massey, resigned. Mr. J. H. Burrell, Jr., succeeds Mr. Colwell as Secretary and Treasurer, and will also continue to act as General Freight and Passenger Agent.

Pittsburgh, West Virginia & Southern.—This company was fully organized at a meeting held in Grafton, W. Va., Jan. 31, when the following directors were chosen: Hon. Waitman T. Willey, Dr. J. R. Thompson, G. W. Johns, A. Fairchild, J. M. Hagans, Morgantown, W. Va.; John Doonan, J. W. Mason, George W. Brown, Dr. G. H. Thayer, Grafton, W. Va.; Milton D. Hays, A. C. Hays, J. H. Miller, J. Reamer, Pittsburgh, Pa. The board elected officers as follows: President, M. D. Hays; Vice-Presidents, Waitman T. Willey, John Doonan; Treasurer, J. Reamer; Secretary, J. H. Miller; Superintendent, A. C. Hays; Solicitor and Manager for West Virginia, George C. Sturgiss.

Providence & Worcester.—At the annual meeting in Providence Feb. 4, the old board was re-elected, as follows: Wm. S. Slater, George A. Leete, John R. Balch, Moses B. I. Goddard, Amos D. Lockwood, Frederick Grinnell, Providence, R. I.; Gideon L. Spencer, Pawtucket, R. I.; Lyman A. Cook, Woonsocket, R. I.; Paul Whitin, John C. Whitin, Whitinsville, Mass.; Estus Lamb, Blackstone, Mass.; Henry Chapin, Elijah B. Stoddard, Joseph E. Davis, Worcester, Mass.; Eben B. Phillips, Boston.

Rock Island & Peoria.—The officers of this company are: President, P. L. Cable; Vice-President and Superintendent, R. R. Cable; Auditor, H. C. Whitridge; General Freight and Ticket Agent, J. V. Mahoney; Treasurer, Joseph Gaskell; Master Mechanic, Joseph Elder. The offices are at Rock Island, Ill., except that of the Master Mechanic, which is at Peoria, Ill.

Sabine Pass & Northwestern.—At the annual meeting in Beaumont, Tex., Jan. 17, the following directors were chosen: J. Burwell, H. J. Snow, James Orr, J. M. McDonald, J. R. Jones, Henry Erwin, A. W. Acheson. The board elected J. Burwell, President; Dr. H. J. Snow, Vice-President; Dr. James Orr, Secretary.

Seattle & Walla Walla.—At the annual meeting in Seattle, Wash. Ter., recently, the following directors were chosen: A. A. Denny, Wm. N. Bell, John Collins, J. M. Colman, Bailey Gatzert, John Leary, James McNaught, F. Matthias, Wm. Renton, A. Mackintosh, C. B. Shattuck, H. L. Yesler, L. B. Andrews. The board subsequentiy elected A. A. Denny President; H. L. Yesler, Vice President; B. F. Briggs, Treasurer; Roswell Scott, Secretary. J. M. Colman continues Superintendent.

Selma, Rome & Dalton.—Mr. Robert Lapsley has been appointed Treasurer, in place of George M. Chapman, resigned.

Southern Maryland.—At the annual meeting in Baltimore, Feb. 4, the following directors were chosen: John Van Riswick, Samuel S. Smoot, Charles B. Church, C. E. Rittenhouse, John Pettibone, W. B. Reid, of Washington City; E. N. Darling, of Kansas; J. H. Wiggin, of New Hampshire; J. M. Scovel, of New Jersey; George W. Cram, of Connecticut; J. M. Broom, S. T. Wales, of Maryland.

St. Paul, Stillwater & Taylor's Falls.—At the annual meeting in St. Paul, Minn., Jan. 31, the following directors were chosen: M. Auerbach, R. Blakeley, Wm. Crooks, W. B. Dean, E. F. Drake, E. L. Hersey, R. F. Hersey, J. L. Merriam, B. Presley, Isaac Staples, A. B. Stickney, H. R. Thompson, A. H. Wilder.

Terre Haute & Indianapolis.—The organization of this road, as operated since Jan. 31, when the contract with the Indianapolis & St. Louis was terminated, is as follows: Major John E. Simpson, General Manager, office at St. Louis; Joshua Staples, Chief Engineer, in charge of construction, permanent way, bridges and buildings, office at Indianapolis; Charles E. Follett, General Passenger Agent, office at St. Louis; H. W. Hibbard, General Freight Agent, office at St. Louis. Major Simpson and Mr. Follett held the same positions for the two roads, when they were worked together. Mr. Staples was General Superintendent of the Terre Haute & Indianopolis, and Mr. Hibbard Assistant General Freight Agent.

Texas & New Orleans.—Mr. E. A. Campbell has been appointed Master Mechanic in place of Solomon Bells.

Union Pacific.—Mr. A. Traynor is appointed General Baggage Agent, with office at Omaha, Neb.

Wisconsin Railroad Commissioner.—The Governor of Wisconsin last week withdrew the name of Gen. Jere. Rusk, and nominated for Railroad Commissioner A. J. Turner, of Portage, who was promptly confirmed by the Senate. Mr. Turner was Chief Clerk of the State Senate.

PERSONAL.

—Mr. James Nasmyth, the inventor of the steam-hammer, is the largest stockholder in the Metropolitan (London underground) Railway.

—Mr. Reuben Ragland, formerly President of the Petersburg Railroad Company, and a large owner of its stock, was recently adjudged a bankrupt. His principal assets were railroad securities, most of them now very much depreciated in value.

—Mr. Wm. E. Main died in Santa Barbara, Cal., Jan. 27, at the age of 42 years. He was a native of New York State, but in 1861 went to Peoria, Ill, and entered the service of the Toledo, Peoria & Warsaw Company as a clerk. About 1865 he was made General Freight and Ticket Agent, and held both positions for several years until the departments were divided, when he became General Freight Agent, and so continued until 1873, when he resigned on account of ill-health, and went to California. He has been back east two or three times since that time, the last visit being only a few months ago. His disease was consumption. He leaves a wife and one daughter. His services were so much appreciated by the company that his former position was kept open for him a long time, in the hope that he would recover his health.

—Capt. Joseph Jaques, a director, and formerly Vice-President and Superintendent of the East Tennessee, Virginia & Georgia Railroad, was recently elected Mayor of Knoxville, Tenn., by a large majority, receiving votes from both parties.

—Mr. Henry S. Drinker, for some time connected with the Lehigh Valley Company as an engineer, and well known for his connection with the great Musconetcong Tunnel, and likely soon to be very widely known throughout the engineering world as the author of the completest work on tunnels, rock drills and explosives (now in press), has adopted the law as a profession, after several years of successful practice as an engineer, and purposes to make a specialty of law questions connected with railroad and mining engineering, in which his experience as an engineer will be of the greatest value.

—Mr. Wm. B. Knight, a young engineer recently employed on the New York water works, sailed last week for Panama, where he is to be employed on the Panama Railroad as an aid to Mr. Brandon Mozley, the Superintendent.

THE SCRAP HEAP.

Railroad Manufactures.

The Co-operative Iron Works, at Danville, Pa., have been running steadily for some time, with the exception of one or two short stops for repairs.

Wilson Brothers & Co., of Philadelphia, have completed drawings for an iron bridge over the Staunton River for the Richmond & Danville road. The bridge is to replace one carried away by the recent freshets. It will be built by the Edgemoor Iron Co., of Wilmington, Del.

The Globe Iron Works, at Cleveland, O., are building a 400-horse power engine for the Standard Oil Co.

The Keystone Bridge Works are building an iron bridge over the Monongahela River at Port Perry, Pa., for the connecting line between the Pennsylvania and the Pittsburgh, Virginia & Charleston roads. The bridge will have one span of 40 feet over the Pittsburgh & Connellsville Railroad; then three spans of 70 feet each; then a channel span of 260 feet, and eight spans from 135 to 140 feet each. The channel span is through, and all the others deck spans.

The Edgar Thomson Steel Works, at Braddocks, Pa., are at present giving employment to over 600 men. About 180 tons of steel rails is the average daily production of the rail department. The converting department (Bessemer process), is producing daily about 300 tons of steel ingots.—*Pittsburgh Telegraph.*

The car shops at Oxford, Pa., were sold recently at public sale by Edward Patterson, Trustee, and bought by W. D. Alexander for $6,225. The original cost was about $60,000. The works were started several years ago on the co-operative plan by a corporation known as the Oxford Co-operative Car Co., and were quite successful for a time.

The American Metaline Co. has moved from its old quarters at No. 61 Warren street to Nos. 204 and 206 Greene street, New York. The removal was made necessary by increase of business, the new quarters being much larger and more convenient than the old.

The stockholders of the Wyandotte Rolling Mill Co. met in Detroit, Jan. 28, to consider the question of going into bankruptcy. A statement was presented showing the embarrassed condition of the company and the annoying suits pending against it. A detailed statement showed the capital stock of the company to be $824,000; nominal assets about $1,000,000. This latter consists of the plant and real estate at Wyandotte and at Leland, and a large amount of accounts receivable, of uncertain value. The bonded indebtedness, with interest, now amounts to about $260,000, and the other secured indebtedness to about $100,000. The unsecured and floating debt amounts to about $65,000. Foreclosure proceedings have been already begun by the trustees of the mortgage bonds, but it is uncertain when these may be brought to a conclusion and a sale had under them. After some sharp discussion it was resolved to file a voluntary petition in bankruptcy. This course was opposed by nearly all the smaller stockholders, but was carried by the vote of the Ward estate, which owns a majority of the stock.

The Altoona shops of the Pennsylvania Railroad last year built 22 new engines and rebuilt or repaired 224 old ones.

The Brooks Locomotive Works at Dunkirk, N. Y., have recently shipped a freight engine to the Illinois Midland road; two narrow gauge engines to the Olean, Bradford & Warren, and three consolidation engines to the Erie. These Erie engines are of standard gauge.

The stockholders of the Pittsburgh & McKeesport Car Co. whose works at McKeesport, Pa., were burned some time since, have finally decided to wind up the business, and not to rebuild, as at first proposed.

American car-wheels, for both street and railroad cars, are now offered in the London Market. Advertisements appear recommending the "steeled" wheels made by Whitneys in Philadelphia. The prices mentioned are £3 10s. to £4, or about $17.50 to $20.

The Chicago, Burlington & Quincy shops at Aurora, Ill., are turning out 21 freight cars per week.

King & Wheelock, of Des Moines, Ia., have recently completed an iron highway bridge 900 feet long over the Des Moines River at Bonaparte, Ia. They are at work on two other bridges over the same river.

Put Her Ticket in a Safe Place.

The Chicago *Times* tells the following:

"A little brunette, as pretty as a picture, who lives out at Muscatine, Iowa, and is on her way to Buffalo, N. Y., arrived in town on yesterday afternoon over the Chicago and Rock Island road. While changing over to the Lake Shore road she thought she would look and see if her ticket was all right. It had disappeared from the place where she had secreted it—a little pocket on the inside of her dress, on the left-hand side, just around the brow of the hill. Her almost unspeakable grief at this discovery excited the liveliest interest among the bystanders, who were dying to help so handsome a girl out of so awkward a dilemma. What in the world to do, with train-time near at hand, and not enough wherewithal to pay for another ticket, was driving her wild, and the most delicious tears one ever saw, or tasted, trickled from her chin. Acting upon somebody's advice, the girl rushed for the office of the General Passenger Agent, followed by the whole mob of sympathizers. Mr. Morse, who is a good judge of nature, and Mr. Davis, who is a particularly good judge of women, both saw that the girl was honest, and the former was getting out his blanks to issue her a pass. Before writing it, however, he insisted that the brunette should make one more search for the missing ticket, as he believed that it was sticking about her clothes somewhere. With a face suffused with blushes, the lady began her exploration, assisted by the gallant Davis, while the more modest Morse pretended to be looking out of the window. Presently the girl uttered a shrill scream of delight, and renewed her tears, this time for very joy. Instead of sticking the ticket, as she supposed, into the little pocket, she had shoved it back to the armpit, where it was nestling cosily when found. The young lady thanked everybody, whirled round and round in girlish glee, and in a minute was kiting away east-bound on the 5:15 train."

Experiments With the Electric Light.

On the 18th ult., an experiment was made with the electric light in the & Lake Shore Michigan Southern railway shops in Cleveland. The shop in which the experiment was tried was 80 × 150 feet, filled with machinery, lumber, etc., and the ceiling and walls begrimed as is usual in such places. The whole was brilliantly illuminated by two electric lamps, one hung near each end. Each light was 2,000-candle power, or equal to 125 gas burners of usual size. The electricity was furnished by a three-horse Brush dynamo-electric machine. The cost was estimated as follows: Cost of three-horse power, estimated ½ cent per horse-power per hour, 1½ cents; consumption of carbon in two lamps, 3½ inches, 7 cents; 10 per cent. per annum on cost of engine and machine, 3½ cents; total cost per hour of light equal to 250 gas burners, 12 cents; ten six-foot gas burners, gas at $2 per thousand, cost 12 cents; relative expense, 1 to 25. In addition to these advantages, the light is pure white, like sunlight, there is no danger in its use corresponding to defective or leaky gas pipes, and the amount of carbonic acid and other deleterious gases given off is asserted to be, compared to gas, as 1 to 200.—*Railway World.*

The Meanest Dead-Head.

The Somerville (N. J.) *Unionist* says: "We have often heard of persons to whom the medal had been awarded for acts of meanness, but an instance was told us the other day which bears off the prize above anything we have yet heard or seen published. A young man well known about Millstone, noted for being possessed of an exceedingly empty skull, is in the habit of riding to and from New Brunswick in the cars. One Saturday night not long ago he was in New Brunswick without a penny in his pocket and wanted to get home. He told the conductor his situation and asked to be passed over the road and he would pay when he returned on Monday. The conductor, knowing the young man well, acceded to his request. When the fellow reached home he wrote a plausible letter to the railroad company to the effect that they had better be looking after their interests on that road, as the conductor was in the habit of passing his friends free. Whereupon the conductor was suspended, and is now out of employment."

Tests for Steel Boiler Plates.

In a recent number of *Engineering* it is stated that Mr. Webb, Locomotive Superintendent of the London & Northwestern Railway, "continues to obtain most satisfactory results with steel, and he now makes all his boiler shells of that material. The steel plates used are all manufactured at the Crewe Works, and each plate used for boiler purposes is tested. The standard tests are that the plate after being annealed shall bend double, cold; that a hole ⅝ in. in diameter punched in a strip from 3 in. to 3½ in. wide shall drift out, cold, to from 1½ in. to 1¼ in. in diameter without the strip showing signs of failure, and that the material shall stand from 28 tons to 30 tons per square inch tensile strain with an elongation of about ¾ in. in a length of 2 in. before fracture. Mr. Webb informs us that he has now no difficulty in getting these conditions fulfilled."

American Street Cars in England.

A correspondent writes as follows to the Birmingham (England) *Daily Post*: "Only a little while ago I was in Hull, and my attention was directed to the tramway cars recently supplied to the Hull Tramways Company. I was very much pleased with them in every way, more especially with the pretty one-horse cars, which work very smoothly and comfortably. But to my astonishment I found that all the cars were of American build. On inquiring from Alderman Banister, who is the life and soul of the Hull Tramways Company, why he had not come to Birmingham for the cars he wanted, he informed me that he had a very good reason indeed, viz., that he had been able to buy the New York cars delivered in Hull for an average of £35 per car less than the English prices."

An Old Iron Car.

The *National Car Builder* says: "The private car of President Cass, of the Fort Wayne road, which has the number '100' inscribed on it, was built 25 years ago. It is constructed entirely of iron, and has been repeatedly thrown from the track and rolled down embankments, and never damaged to the extent of an indentation. Wooden cars have gone to smithereens all around it, and it has always come out without a scratch. But it is an oven in summer time, and a refrigerator in winter."

The First Locomotive in Virginia.

The Raleigh (N. C.) *News* says: "Albert Johnson, Esq., of our city, assisted in putting together the first locomotive engine used in Virginia and North Carolina. It was built by Edward Bury, at Liverpool, England, and was brought to this country and delivered at Petersburg. The engine was named the 'Roanoke,' and its weight only 5½ tons. The cylinders were 8 × 16, and the driving wheels 4½ feet in diameter; just in front of these were two pilot wheels, each 3 feet in diameter. There was no truck as in engines of the present time, nor was a tender used."

Steam on the Erie Canal.

A considerable part of the report of John D. Van Buren, State Engineer and Surveyor, on the canals of New York in 1877, is devoted to the subject of canal transportation, with analysis of its cost by various methods. As an introduction to these estimates, the report says:

"For several years past those interested in canal transportation have anxiously studied the question of steam propulsion, in the hope that it could be successfully applied on the canals, and that its introduction would cause a revival of their waning trade. Many attempts have been made during the past seven or eight years to introduce it on canals; the old mode, however, with animal power, still prevails. The revival of trade during the past season has added renewed interest to this subject, and in the general effort to secure the cheapest mode of transportation, steam propulsion has been used to a greater extent than ever before. Its use has, however, not been general; a small portion only of the tonnage has been moved by steam power. The modes employed were: single steamers, like the 'Baxter' boats; ordinary tugs, with a train of from two to five boats in tow; and the 'steamer and consort' plan, in which an ordinary boat is pushed ahead of the steamer."

Then follow short descriptions of the various modes of transportation, including the common animal power, the Baxter steamers, the Belgian system, by which the canal is provided with a cable laid on the bottom through its entire length, and a steam tow-boat with a grooved driving-wheel over which the cable passes. The drum is then turned by the machinery in the tow-boat, causing the cable to pass over it without slipping. Thus the tow-boat is drawn along the cable. Following is a table showing the estimated costs of transportation of freight between Buffalo and New York:

Mode of Movement.	Number of Boats in Each Trip.	Estimated Cost. Exclusive of Tolls.			Inclusive of Tolls.		
		P'r ton	Pr tn mile.	Per bu Wheat	Per ton	P'r tn mile.	Per bu Whe't
			mills.	cents.		mills.	cents.
Animal power	7	$1.896	3.83	5.688	$2.24	4.53	7.378
Baxter steamers	10	1.92	3.88	5.76	2.265	4.58	7.45
Belgian system	8	1.741	3.52	5.22	2.085	4.21	6.91
Belgian system	9	1.596	3.22	4.79	1.94	3.92	6.48
Steamer and consort	9	1.574	3.18	4.72	1.92	3.88	6.41
Steamer and consort	10	1.55	3.13	4.65	1.895	3.83	6.34

This shows the cost by the cheapest steam power to be 18 per cent. less than by animal power, making a saving of just about one cent per bushel between Buffalo and New York, and bringing up the whole cost with the present toll 6.34 cents.

(*Continued on page* 67.)

TRAFFIC AND EARNINGS.

Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending June 30:

	1876-77.	1875-76.	Inc. or Dec.		P. c.
Mem. & Charlest'n	$961,350	$1,033,367	Dec..	$72,017	7.0
Expenses.....	643,827	712,136	Dec..	68,309	9.6
Net earnings...	$317,523	$321,231	Dec..	$3,708	1.2
Earn. per mile .	3,292	3,539	Dec..	247	7.0
P. c. of expnses.	66.97	68.91	Dec..	1.94	2.8

Year ending Dec. 31:

	1877.	1876.			
Central, of Iowa..	$740,000	$717,526	Inc..	$22,474	3.1
St. P. & Duluth...	559,275	.....	.....	.....	....
Expenses.....	397,066	.....	.....	.....	....
Net earnings...	$162,209	.....	.....	.....	....
Earn. per mile..	3,369	.....	.....	.....	....
P. c. of exp'nses	71.03	.....	.....	.....	....
St. Louis & Southeastern.....	1,099,503	1,990,022	Inc..	9,481	0.9
Expenses	850,096	849,443	Inc..	653	0.1
Net earnings...	$249,407	$240,579	Inc..	$8,828	3.7
Earn. per mile.	3,088	3,062	Inc..	26	0.9
P. c. of exp'nses	77.28	77.93	Dec..	0.65	0.8
St. Paul & Sioux City	544,881	574,772	Dec..	29,891	5.5
Sioux City & St. Paul	342,692	359,132	Dec..	16,440	4.6

Month of December:

Dakota Southern.	$15,185	$11,673	Inc..	$3,512	30.0
Great Western, of Canada.....	376,800	249,100	Inc..	127,700	51.3
Net earnings...	104,300	*20,800	.....	.....	....
P. c. of exp'nses	72.30	108.35	Dec..	36.05	33.3
St. Paul & Sioux City.....	46,605	40,444	Inc..	6,161	15.3
Sioux City & St. Paul.....	33,797	24,312	Inc..	9,485	39.0

Month of January:

	1878.	1877.			
Bur., Cedar Rap. & Northern....	$165,412	$73,964	Inc..	$91,448	123.3
Chi., Milwaukee & St. Paul....	706,000	375,553	Inc..	330,447	88.0
Michigan Central.	543,878	464,053	Inc..	79,825	17.2
St. Louis, Kan. C. & Northern....	284,289	240,042	Inc..	24,245	10.1

Third week in January:

Denver & Rio G.	$13,100	$8,296	Inc..	$4,804	57.1

Week ending Jan. 25:

Gt. West., of Can.	$113,091	$53,635	Inc..	$59,456	110.9

Week ending Jan. 26:

Grand Trunk.....	$171,229	$167,200	Inc..	$4,029	2.4

* Deficit.

Grain Movement.

Receipts and shipments of grain of all kinds for the week ending Jan. 26, were, in bushels:

	1878.	1877.	Increase.	P. c.
Northwestern receipts.....	3,513,465	1,721,443	1,792,022	104.2
" shipments..	2,488,526	727,113	1,761,413	242.3
Atlantic receipts.....	3,517,023	1,461,707	2,055,316	140.7

The shipments from the Northwest for this week last year are much the largest since the close of navigation, and among the largest ever made by rail.

The receipts at Atlantic ports were distributed as follows: 42.6 per cent. to New York, 22.4 to Philadelphia, 17.6 to Baltimore, 8.8 to New Orleans, 7.1 to Boston, 1.4 to Portland, and 0.1 to Montreal.

Receipts of grain and flour at New York by the three principal railroad routes during the month of January were:

Grain:	1878.	1877.	Inc. or Dec.	P. c.
New York Central.....	3,892,337	482,019	Inc..3,410,318	707.5
Erie.....	1,530,753	760,700	Inc.. 770,053	101.2
Pennsylvania.....	678,990	552,376	Inc.. 126,614	22.9
Total grain.....	6,102,080	1,795,095	Inc..4,306,985	238.6
Flour:				
New York Central	193,987	50,653	Inc.. 143,334	283.0
Erie.....	104,738	58,295	Inc.. 46,443	80.0
Pennsylvania	50,988	88,690	Dec.. 37,702	42.5
	349,713	197,638	Inc.. 152,075	71.9

Of the total grain, 63.8 per cent. was received this year by the New York Central, 25.1 by the Erie, and 11.1 by the Pennsylvania.

Receipts and shipments of grain of all kinds from Chicago and of wheat at Milwaukee for the month of January were, in bushels:

	1878.	1877.	Increase.	P. c.
Chicago.....	5,187,533	4,240,283	947,260	22.3
Milwaukee.....	1,912,205	552,841	1,359,324	246.0

Chicago shows an increase of 1,664,000 bushels in wheat and a decrease of 1,261,000 in corn.

Baltimore grain receipts for January were as follows:

	1878.	1877.	Inc. or Dec.	P. c.
Flour, barrels.....	116,215	88,232	Inc.. 27,983	31.7
Wheat, bushels.....	804,391	146,398	Inc..747,993	510.9
Corn.....	1,691,745	2,060,037	Dec .368,292	17.9
Other grain.....	33,007	42,794	Dec . 9,787	22.9
Total grain.....	2,619,143	2,249,229	Inc..369,914	16.4
Total (flour reduced to grain).....	3,200,218	2,690,389	Inc..509,829	18.9

Exports for the month were 59,095 barrels flour and 2,978,166 bushels grain.

Coal Movement.

The anthracite tonnage reported for the week ending Jan. 26 was: 1878, 183,501; 1877, 245,215; decrease, 61,714 tons, or 25.2 per cent.

Semi-bituminous and bituminous tonnages not heretofore reported for the year ending Dec. 31 are as follows:

Coal:	1877.	1876.	Inc. or Dec.	P. c.
East Broad Top.....	54,738	65,999	Dec.. 11,261	17.1
Bellefonte & Snow Shoe.	42,979	50,916	Dec.. 7,937	15.6
Allegheny Reg'n, P. R.R.	184,464	209,315	Dec . 4,851	11.9
Penn. and Westmoreland gas coal.....	786,039	896,590	Dec..110,551	12.3
West Pennsylvania R. R.	187,345	173,324	Inc.. 14,021	8.1
Southwest Penna. R. R..	38,910	57,150	Dec . 18,240	31.9
Pittsburgh Reg'n, P. R.R.	379,673	310,846	Inc.. 68,827	22.1
Total.....	1,674,148	1,784,140	Dec . 89,992	5.1
Coke:				
West Pennsylvania, R. R.	58,483	57,797	Inc.. 686	1.2
Southwest Penna. R. R..	635,990	539,640	Inc.. 96,350	17.9
Westmoreland Region...	64,905	59,462	Inc.. 5,443	9.1
Pittsburgh Reg'n, P. R.R.	107,840	162,126	Dec.. 54,286	33.5
Total.....	867,218	819,025	Inc.. 48,193	5.9

The coal tonnage of the Pennsylvania Railroad and branches for the year was as follows:

	1877.	1876.	Inc. or Dec.	P. c.
Anthracite.....	799,654	791,469	Inc.. 8,185	1.0
Semi-bituminous.....	1,715,706	1,499,306	Inc..216,460	14.4
Bituminous.....	1,571,254	1,747,225	Dec .175,971	10.1
Coke.....	867,218	819,025	Inc.. 48,193	5.9
Totals.....	4,953,892	4,857,025	Inc.. 96,867	2.0

Bright & Co., of Philadelphia, have been recently shipping anthracite coal to several Southern ports, chiefly New Orleans and Galveston. They have chartered one or two of the Reading Company's steam colliers for this trade.

The Cumberland Region is agitated by a new movement to reduce the miners' wages. The reduction proposed is from 55 cents a ton to 40 cents, but there is also to be a reduction of the weight required to a ton. Most of the companies require 3,000 pounds, but it is proposed to cut this down to 2,500 or 2,600 pounds.

Petroleum Production.

Stowell's *Petroleum Reporter* estimates the production of crude oil in the United States for the year as follows, in barrels:

	1877.	1876.	Inc. or Dec.	P.c.
Pennsylvania	13,135,671	8,968,906	Inc..4,166,765	46.5
Ohio.....	36,500	55,000	Dec.. 18,500	33.6
West Virginia.....	172,000	120,000	Inc.. 52,000	43.3
Kentucky and Tenn...	73,000	.....	Inc.. 73,000	....
California.....	73,000	32,000	Inc.. 41,000	124.1
Totals.....	13,490,171	9,175,906	Inc..4,314,265	47.0

The shipments out of the Pennsylvania oil fields and the proportions going to different destinations are given as follows:

	1877.	1876.	Inc. or Dec.
Total shipments, barrels...	12,832,573	10,191,452	Inc. 2,641,121
To New York.....	35.2 per ct.	24.5 per ct.	Inc.10.7 per ct.
To Cleveland.....	24.3 "	22.5 "	Inc. 1.8 "
To Pittsburgh.....	14.1 "	19.1 "	Dec. 5.0 "
To Creek refineries.....	13.2 "	14.1 "	Dec. 0.9 "
To Philadelphia.....	6.2 "	8.7 "	Dec. 2.5 "
To Boston.....	1.8 "	1.8 "	.....
To Baltimore.....	1.7 "	2.0 "	Dec. 0.3 "
To local points	1.7 "	1.6 "	Inc. 0.1 "
To Ohio River refineries....	1.2 "	3.2 "	Dec. 2.0 "
Destroyed by fire	0.6 "	2.5 "	Dec. 1.9 "
Total.....	100.0 pr. ct.	100.0 per ct.	.....

This statement gives simply the disposition of the crude oil, taking no account of subsequent shipments of refined oil.

Pittsburgh petroleum business for the year was as follows:

	1877.	1876.	Inc. or Dec.	P.c.
Crude received, barrels.	1,807,034	1,953,211	Dec..146,177	7.5
Refined oil shipped east, reduced to equivalent in crude.....	1,020,628	1,571,434	Dec..550,806	35.1
Home consumption and in stock.....	786,406	381,777	Inc ..404,629	106.0

Norfolk Cotton Business.

Cotton receipts at Norfolk, Va., for January were 75,473 bales, an increase of 24,275 bales, or 47.4 per cent., over January, 1877. For the five months of the cotton year from Sept. 1 to Jan. 31, the receipts were as follows, in bales:

	1877-78.	1876-77.	Dec.	P. c.
Atlantic, Mississippi & Ohio R. R..	142,441	159,858	17,417	10.9
Seaboard & Roanoke R. R.....	139,970	218,633	78,663	36.0
Canals and otherwise.....	33,119	34,185	1,066	3.1
Total.....	315,530	412,676	97,146	23.5

Of the total this year 140,820 bales were consigned to Norfolk, and 174,710 were bound through to points beyond.

East-Bound Freight Rates.

A meeting began in Chicago, Feb. 6, at which were present a large number of representatives of the companies interested in the maintenance of east-bound rates. The meeting was private, but it is said that there was much discussion over a proposition to pool existing contracts, especially those on Minnesota flour. A resolution is said to have been passed requesting the various roads having contracts for east-bound freight to report them to a special committee, whose business it should be to arrange such a disposition of them as would not interfere with the establishment of new rates. The meeting then adjourned until the next day.

OLD AND NEW ROADS.

Billerica & Bedford.—At a meeting of the directors held Jan. 30, it was voted to put the road in charge of Register in Bankruptcy C. T. Howe, until an assignee can be appointed. The road will continue to be worked for the present.

Buffalo, Syracuse & Albany.—A company by this name has been organized for the purpose of building a narrow-gauge railroad along the tow-path of the Erie Canal, from Albany to Buffalo, with branches from Rochester to Millgrove; to Oswego; from Rome to Carthage, and from Utica to Binghamton. The object of the company is to use locomotives on this track for the purpose of towing boats, and to run freight trains when the canals are closed. The company will apply to the Legislature for the necessary permission to use the tow-path, offering in return to keep the canals in repair. The leading projector of the company is Edward Crane of Boston.

Chicago & Springfield.—The deed transferring the Gilman, Clinton & Springfield road to this new corporation has been duly recorded at Springfield, Ill. There was also recorded at the same time a mortgage securing $2,000,000 bonds issued by the new company.

Cincinnati, Sandusky & Cleveland.—At a meeting of the second-mortgage bondholders in Boston, Jan. 31, it was resolved to petition the Court to appoint DeWitt C. Brown (now General Manager of the road) Receiver, in place of J. S. Farlow. It was also resolved to fund several coupons in ten-years scrip, as proposed by the company.

Dallas, Palestine & Southeast Texas.—This company was recently reorganized and arrangements are being made to begin work on the road. It is to run from Dallas, Tex., southeast through Palestine to the Sabine River, about 260 miles, and is intended to form part of a through line from Dallas to New Orleans.

Danbury & Norwalk.—At a special meeting of the stockholders held in Norwalk, Conn., Jan. 28, a proposition from the Housatonic Railway Company to lease the road was rejected. A committee was appointed to confer with the officers of the Housatonic Company on matters in dispute between the two companies.

Danville, Hazleton & Wilkesbarre.—A special dispatch to the Philadelphia *Times* from Bloomsburg, Pa., Feb. 5, says: "In November last William Greenough, acting as trustee for the bondholders of the Danville, Hazleton & Wilkesbarre Railroad Company, filed a bill in equity foreclosing the mortgage upon the road. This was done to secure bonds amounting to $1,400,000, the largest part of which is held in Philadelphia and by the Pennsylvania Railroad Company. Before the sale could be effected under the foreclosure, however, Simon P. Kase, through his counsel, Hon. F. C. Brewster and H. F. Hepburn, petitioned the Court to be allowed to make a defense to the bill filed by the trustee. Kase was the owner of $29,000 of the first-mortgage bonds of the company and of 5,090 shares of the capital stock of the company, the par value of which was $254,500. After elaborate arguments the matter was referred to Samuel Dickson, Esq., of Philadelphia, as master. Mr. Dickson reported in favor of the bondholders, as represented by the trustees, on two counts of the three presented to him. Exceptions were filed to the report, and the matter was argued yesterday before Judge Elwell, at this place. Judge Elwell dismissed the petitions and exceptions, and made an order for the sale of the mortgaged property. The counsel for Mr. Kase will appeal to the Supreme Court."

Davenport, Le Claire & Princeton.—This company, at first called the Davenport & Scott County, has been fully organized under the above name. The object of the company is to build a narrow-gauge railroad from Davenport, Ia., northeast through Le Claire to Princeton, about 20 miles.

Davenport & Northwestern.—An effort is being made to raise the money needed to extend this road from its present terminus at Fayette, Ia., north by west to Cresco, some 45 miles. A large part of the grading was done several years ago.

Erie.—The Pennsylvania Legislature has ordered an investigation into the manner in which this company has, as alleged, evaded one of the requirements of its charter in Pennsylvania. The charter required that it should maintain a bridge over the Delaware at Port Jervis, but some years ago a special charter was obtained for a corporation known as the La Monte Mining & Railroad Company, to which the bridge in question was transferred. It is charged that this company does not maintain the bridge, that it is not responsible, and that its organization and the transfer of the bridge to it were really fraudulent and and designed solely to enable the Erie to get rid of the obligation to maintain the bridge.

The motion for leave to enter an order discontinuing the Attorney General's suit against this company was argued before the Supreme Court Jan. 30. The chief point was whether the Attorney General's consent to a discontinuance once given could be revoked before an order to that effect had been entered, and whether, therefore, Attorney General Fairchild's revocation of his predecessor's consent was operative. The Court reserved its decision.

The preliminary examination of Receiver Jewett on the charge of perjury was begun Feb. 5 and continued on the following day. It was brought to an abrupt close by a writ of *certiorari* removing the case to the Supreme Court on some legal points.

European & North American.—The bondholders of the New Brunswick section of this road have given notice of application to the Provincial Legislature for an act to incorporate them as the St. John & Maine Railway Company, with power to buy and work the line from St. John, N. B., west to the St. Croix River. This section is now in the hands of Receivers for the benefit of the bondholders.

Fitchburg.—At the annual meeting in Boston, Jan. 29 the stockholders voted to ratify the lease of Constitution Wharf in Boston. They also authorized the directors to issue additional stock and take other action to provide additional terminal facilities, as provided by the amendment to the railroad laws passed in 1874.

***Galveston, Brazos & Colorado.**—This road has been leased to Drennan, Sullivan & Co., of Galveston, Texas, who will run it hereafter, and who have settled some pressing claims for equipment furnished the road. It is a narrow-guage road, running from Galveston westward 15 miles, and is employed chiefly in hauling sand.

Grayville & Mattoon.—The United States Circuit Court at Springfield, Ill., has appointed J. D. Herkimer Receiver of this road. Later advices state further that the Court has authorized the Receiver to issue $125,000 in certificates for the purpose of building 11 miles required to complete the road.

The road was begun several years ago and in 1876 was sold under foreclosure, and bought by the contractors, who in that year built 20 miles, from Olney, Ill., to Newton, and last year extended it 30 miles further, to Prairie City. It is intended to connect at Mattoon with the Decatur, Mattoon & Southern, and is, we believe, to be consolidated with that company.

Green Bay & Minnesota.—This road has recently been placed in the hands of a receiver, on application of Mr. John I. Blair and others, bondholders. The Receiver is Mr. Timothy Case, who was lately made General Manager of the road. The road, which was finished in 1873, extends from Green Bay, Wis., across that State to Winona, Minn., 218 miles, and there is also a branch to La Crosse, 29 miles, of which 22 miles are leased from the Chicago & Northwestern. The bonded debt by the last report consisted of $3,200,000 first-mortgage bonds, on which no interest has been paid for several years, and $780,000 second-mortgage bonds issued to fund unpaid coupons. The net earnings of the road have been very small.

Gulf, Colorado & Santa Fe.—The directors have voted to accept a proposition from James H. Brooks, who offers to build the extension of the road from its present terminus at Arcola, Tex., to Brenham, provided the company will provide the iron and also secure the sale of $100,000 of its bonds in Galveston.

Havana, Rantoul & Eastern.—An extension of this road has been completed and opened for business from the former terminus at Alvin, Ill., east by south to West Lebanon, Ind., 12 miles. This new extension gives the road a connection with the Wabash Railway, and a better outlet for its business.

Long Island.—A suit has been begun in the name of the Attorney-General of New York against the Receiver, the company and others. The complaint gives, as usual, the history of the company, and then proceeds to charge that the leases of the Southern and the Flushing, North Shore & Central roads were contrary to the charter of the Long Island Company and therefore illegal, and that they were made to protect the interests of certain parties in the leased roads and at the expense of the Long Island Company; that the leased roads show large deficits and are a constant drain on the lessee. It is further charged that the appointment of Col. Sharpe as Receiver was made by collusion, and in order to protect the interests of certain creditors, and in order to maintain the control of certain parties over the road, and to continue the leases before complained of. The Court is asked to remove Receiver Sharpe; to order that the company be dissolved, its property sold and the proceeds distributed, and to appoint a new receiver pending these proceedings.

Madeira & Mamore.—The contractors for this South American road last week met with a serious loss in the wreck of the steamer Metropolis, which sailed from Philadelphia Jan. 29, with a lot of rails and other materials for the road, and some 225 passengers, chiefly laborers to be employed on the work. In the terrible storm of Jan. 31 the ship was driven ashore on the Currituck Banks, on the coast of North Carolina, and became a total wreck. Nearly 100 lives were lost out of the 250 persons on board, and a number were injured, most of those saved losing everything but the clothing they wore at the time. Mr. Paul J. White, the engineer in charge of the party, was among those saved. It has been charged that

the steamer was not seaworthy, and an investigation is in progress. There is no doubt, however, that she was believed to be sound by the contractors who chartered her and by the captain who commanded her, and the risk was taken by the Philadelphia insurance companies.

Missouri, Iowa & Nebraska.—The proposed removal of the terminus of this road from Alexandria, Mo., to Keokuk, Ia., is indefinitely postponed, the company being unwilling to agree to all the terms required by the St. Louis, Keokuk & Northwestern for the use of its track between the two places.

Montreal, Portland & Boston.—The Grand Trunk Company has temporary possession of this road, and will run trains over it for the present, and probably until it is decided which of the two boards of directors is the legal one.

Napa & Monticello.—It is proposed to build a narrow-gauge railroad from Napa, Cal., by way of Putah Creek, to Monticello in the Berryessa Valley, a distance of 35 miles. The estimated cost of the road and equipment is about $295,000. A meeting was held at Napa recently in aid of the road, at which it was resolved to ask for a county subsidy of $5,000 per mile.

National Pacific.—A bill has been introduced in Congress to charter this company with power to build a railroad from the Union Pacific at Cheyenne, Wy. Ter., by way of Fort Laramie to Deadwood in the Black Hills, with a branch from Fort Laramie by the Yellowstone River to Helena, Montana, and thence westward to Puget Sound. The capital stock authorized is $35,000,000, and the bonds $25,000 per mile. The bill gives the company right of way and timber from public lands, and requires it to build at least 50 miles a year.

Pittsburgh & Chicago—A company by this name has filed articles of incorporation in Ohio for the purpose of building a narrow-gauge road about 225 miles long, extending from Youngstown due west across the State to the Indiana line in Paulding County. The capital stock is to be $3,000,000.

Quebec, Montreal, Ottawa & Occidental.—The proposals for the lease of this road from the Province of Quebec were opened Feb. 2. The highest bids were that of A. P. McDonald who offers to pay a yearly rental of $280,000, and that of P. Mitchell, who offers 25 per cent. of the gross receipts.

Rutland.—In the suit between this company and the Central Vermont, lessee of the road, to determine which party should pay the taxes on the property, the Vermont Supreme Court decides that the Rutland Company must pay the taxes on its own property, but the Central Vermont must pay the taxes on the Addison Railroad. The last-named road is leased by the Rutland and sub-leased to the Central.

Seaboard Pipe Line.—The Pennsylvania Senate last week indefinitely postponed the free pipe bill, as it was called, that is the bill providing for the construction of oil pipe lines under a general law. This action kills the bill for this session.

Southeastern, of Canada.—A recent conference in Boston between the directors of this company and those of the Connecticut & Passumpsic Rivers Company broke up without result. The Passumpsic directors insisted upon their right to continue to work the Southeastern until all advances made are repaid, and the Southeastern people were not ready to admit it.

Southwestern Rate Association.—The St. Louis, Kansas City & Northern and the Missouri Pacific companies on Feb. 4 gave the required 40 days' notice of withdrawal from this association.

Spartanburg & Asheville.—This company has executed a mortgage on its property to secure an issue of $670,000 bonds, which is at the rate of $10,000 per mile on the entire length of the road. The trustees are J. B. Cleaveland of Spartanburg, S. C., and William H. Inman, of New York. Principal and interest are made payable in gold.

St. Louis & Southeastern.—The Auditor's report for December is as follows:

	St. L. Div.	Ken. Div.	Tenn. Div.	Entire Line.
Gross earnings	$49,423.52	$29,457.69	$13,430.54	$92,311.75
Expenses	38,693.29	20,840.17	9,033.35	68,566.81
Net earnings	$10,730.23	$8,617.52	$4,397.19	$23,744.94
Per ct. of expenses	78.33	70.64	67.41	74.29

As compared with December, 1876, the entire line shows an increase of $1,502.63, or 1.7 per cent., in gross, and of $2,312.38, or 10.8 per cent., in net earnings.

Syracuse, Chenango & New York.—It is proposed to extend this road from Earlville, N. Y., southward about 20 miles to Norwich along the tow-path of the Chenango Canal. The company has applied to the Legislature for the necessary authority to use the canal.

Tennessee Railroad Taxation.—The Nashville (Tenn.) *American* says: "Some weeks ago a number of bills were filed in the Chancery Court by different railroad companies against the Railroad Tax Assessors for the State and the State Comptroller, to test the question of their total or partial exemption from taxation under the assessments made. Chancellor Cooper granted a preliminary injunction to prevent the assessments being acted on until the rights of the parties could be determined. The cases of three of the railroad companies were selected as test cases, and submitted to the Chancellor upon demurrer, which, it was agreed raised the points in issue. These—the cases of the Memphis & Charleston, the Mobile & Ohio and the Knoxville & Charleston railroad companies—were decided yesterday by the Chancellor. After an elaborate examination of the points decided by the Supreme Court in declaring unconstitutional the 11th section of the act of 1875 for the taxation of railroads, and a review of the provisions of the amendatory act passed in March, 1877, the Chancellor overruled the State's demurrer in the case of the Memphis & Charleston and Mobile & Ohio railroads, on account of charter exemptions, and sustained the demurrer as to the Knoxville & Charleston railroad, for lack of such exemption. On account of their importance, it is thought the cases will be heard in our Supreme Court next week, and it is probable that they will go to the United States Supreme Court."

Western Maryland.—At a recent meeting of the second-preferred bondholders a committee was appointed to submit to the Board of Finance of Baltimore the following proposition:

First—The city to unite with the second-preferred bondholders in proceedings for the foreclosure of the road and its sale under the second-preferred mortgage.

Second—The second-preferred bondholders to assent to the plan of reorganization proposed by the road, provided that the city shall guarantee the payment of a dividend to the first-preferred stockholders (who, under the present organization, are the second-preferred bondholders) up to 4 per cent. per annum.

Third—The second-preferred bondholders to surrender their bonds, with 24 per cent. in accrued interest, to the city, at the rate of 70 per cent. of principal and interest, payable either in cash or city 5 per cent. stock; and same settlement for funded coupons (24 per cent.).

As an alternative it was also proposed to sell the bonds to the city at 80. The board rejected both propositions.

ANNUAL REPORTS.

Junction & Breakwater.

This company owns a line running from Harrington, Del., by a somewhat circuitous route to Lewes, 40 miles. It is controlled by the Old Dominion Steamship Company, which runs a steamship line between Lewes and New York. The same company controls the Breakwater & Frankford and the Worcester roads, which form a branch line from Georgetown, Del., south to Franklin, Md., 56 miles. The road carries a considerable traffic in grain, fruit, fish and oysters. The only debt of the Junction & Breakwater Company is a mortgage for $400,000, held by the State of Delaware.

For the year ending Oct. 31, 1877, the earnings were as follows:

Gross earnings ($1,698 per mile)	$67,919.91
Working expenses (61.91 per cent.)	42,051.48
Net earnings ($647 per mile)	$25,868.43
Interest on bonds	24,000.00
Surplus	$1,868.43

The report says: "A quantity of new iron and 13,000 new ties have been put on the road during the year, the cost of which has been included in the operating expenses. In addition there has been paid for new turn-table and other property $3,305.55. There has been a gain as compared with the preceding year on freight of $6,347.69, and a decrease on passengers, etc., as compared with the unusually large business of the Centennial year of $1,624.88, making a net gain of $4,752.71. The road bed, bridges, pier, etc., have been maintained in good order. The operating expenses have been largely reduced.

"The steamship service between Lewes and New York has been performed as heretofore with regularity, dispatch and satisfaction to the public and the road. The business of the company would, in our opinion, be largely increased by the construction of several short branches, which we would recommend to be done during the present year.

"The company is to be congratulated on this gratifying increase in earnings under reduced rates, and the general business depression of the country for the year, and in the observance of satisfactory working arrangements with connecting roads, though every proper effort has been made to obtain them."

At the recent annual meeting resolutions were passed recommending the immediate construction of the proposed branch from Lewes to Rehoboth Beach, six miles. A proposition was also presented for a short branch to the wharves in Milford from the depot in that town.

New Jersey Midland.

This road extends from West End Junction, N. J., northwest to Unionville, N. Y., 71 miles, and is extended from Unionville to Middletown, 14 miles, by the leased Middletown, Unionville & Water Gap road. Its trains run over the Pennsylvania Railroad track from West End to Jersey City, 2½ miles. The road is in the hands of Receivers under suits for foreclosure of mortgage. The following figures are from a circular issued by the Receivers, chiefly for the information of holders of Receivers' certificates.

The equipment consists of 14 locomotives; 20 coaches and combination cars; 64 milk and box, 63 platform and 49 gondola cars. There are also two steam excavators and hand cars, etc.

The property is valued as follows:

Road and buildings	$3,000,000
Telegraph line	10,000
Equipment	256,000
Shop machinery and tools, materials, etc	50,000
Total	$3,316,000

In order to provide means for the payment of some pressing liens, the Chancellor authorized an issue of Receivers' certificates to the amount of $95,338, upon which interest has been promptly paid from the earnings of the road.

Being issued by order of the Court for the protection and benefit of the mortgaged property these certificates are made a prior lien, and must be provided for in the foreclosure sale, if not sooner paid off from the earnings of the road.

The earnings of the road for the period of the receivership has been as follows:

	1877.	1876.	1875. March 8 to Dec. 31.
Passengers	$137,654.65	$151,293.50	$97,341.10
Freight	470,356.19	448,556.73	303,581.88
Miscellaneous	77,076.33	69,635.24	19,491.56
Total	$685,087.17	$669,485.47	$420,414.54
All expenses	584,049.33	548,015.22	352,577.97
Net earnings	$101,037.84	$121,470.25	$67,836.57
Gross earn. per mile	8,059.85	7,876.30	4,946.05
Net " " "	1,188.68	1,429.06	786.31
Per cent. of expenses	85.25	81.86	83.86

The net earnings are equivalent to about 3 per cent. on the valuation of the property given in the report.

The difference between the above and the monthly statements heretofore published is due to the including of rental and some other charges in the annual statement.

The Receivers have paid the current rental of the Middletown, Unionville & Water Gap road, and have also settled the back rental due at the time of their appointment. They have paid the following amounts for the discharge of liens and for betterments of the property:

Construction	$91,121.46
Equipment	59,687.52
Right of way	41,292.18
Total	$192,101.16

The equipment and right of way claims were all preferential liens, and paid out of current earnings.

Eastern.

The lines worked by this company for the year ending Sept. 20, 1877, were as follows, there being no change from the preceding year:

	Miles.
Boston to New Hampshire State line	41.390
Eastern R. R. of New Hampshire, State line to Portsmouth	15.900
Portland, Saco & Portsmouth R. R.	51.000
Total Main Line, Boston to Portland, Me	108.290
Portsmouth, Great Falls & Conway R. R., Conway Junction to Conway, N. H.	71.370
East Boston Branch	3.310
Charlestown Branch	1.086
Saugus Branch	9.520
Swampscott Branch	3.800
Marblehead Branch	5.000
Lawrence Branch	19.660
South Reading Branch	8.120
Gloucester Branch	17.350
Essex Branch	5.000
Asbury Grove Branch	1.000
Salisbury Branch	3.750
Newburyport City R. R.	2.800
Portsmouth & Dover R. R.	10.880
Wolfboro R. R., Junction to Wolfboro, N. H	12.030
Total worked	281.966

There are 32.80 miles of second track on the Main Line and 6.396 miles on the branches; sidings and other tracks are 66.0425 miles in length. The line owned is the 41.39 miles, from Boston to the State line and 76.596 miles of branches, 117.986 miles in all; the remaining 163.98 miles are leased. The control of the property is now in the bondholders, who elect six of the nine directors, under the agreement in bankruptcy made two years ago.

The equipment in use consists of 94 locomotives; 138 passenger and 37 mail and baggage cars; 793 box and 774 platform cars; 27 snow-plows and 32 gravel and other cars. Of these 22 engines, 2 baggage, 123 box, 131 platform and 5 other cars and 5 snow-plows are leased, the rest owned. There are 57 locomotives and 175 cars equipped with the Westinghouse brake, and 138 cars with the Miller platform.

The balance sheet at the close of the year was as follows:

Stock ($42,358 per mile)		$4,997,600.00
Funded debt ($114,224 per mile)		13,476,777.54
Notes payable		1,214,270.54
Current bills, accounts, pay-rolls, etc		238,620.17
Accrued interest and rentals		302,826.12
Unclaimed dividends		15,817.00
Total ($171,596 per mile)		$20,245,911.37
Road and equipment ($67,143 per mile)	$7,921,900.00	
Other investments, real estate, stocks and bonds	1,517,210.00	
Cash, materials, balances due	507,998.97	
Profit and loss	10,298,802.40	
		20,245,911.37

The funded debt consists of $12,522,338.56 new mortgage certificates of indebtedness; $760,038.98 for which certificates are to be issued, and $194,400 Essex Railroad bonds, which became due Sept. 15, 1876, and of which $131,900 have been renewed for 10 years. Of the unfunded debt $718,368.90 is secured by mortgage on real estate at Charlestown; $228,520 is in litigation. The enormous debit balance of profit and loss represents the losses of the company and the depreciation in investments made under the former management.

The earnings for the year were as follows:

	1876-77.	1875-76.	Inc. or Dec.		P. c.
Passengers	$1,384,117.15	$1,498,408.06	Dec.	$17,025.99	1.1
Mails, Ex. and extra baggage	97,264.92				
Freight	969,852.20	908,932.01	Inc.	60,920.19	6.7
Property and miscellaneous	56,873.24	63,630.95	Dec.	6,757.71	10.6
Total	$2,508,107.51	$2,470,971.02	Inc.	$37,136.49	1.5
Working expenses	1,708,790.20	1,787,376.96	Dec.	78,586.76	4.4
Net earnings	$799,317.31	$683,594.06	Inc.	$115,723.25	16.9
Gross earn. per mile	8,895.07	8,755.18	Inc.	139.89	1.5
Net earn. per mile	2,834.80	2,424.09	Inc.	410.71	16.9
Per cent. of expenses	68.13	72.33	Dec.	4.20	5.8

The income account, in a condensed form, may be stated as follows:

Net earnings		$799,317.31
Rentals of leased lines	$202,086.74	
Interest accrued during the year	572,997.47	
		775,084.21
Profit for the year		$24,233.10
Collections and settlements on old accounts		15,901.77
Excess in inventory of materials on hand		9,678.72
Increase in value Pullman Palace Car Co. stock		1,800.00
Total		$51,613.59
Old accounts, bad debts, etc	$2,261.15	
Expenses and errors of former years	20,883.52	
Old claims against Boston & Maine compromised	112,496.44	
Old claims against Maine Central compromised	58,903.36	
Depreciation in real estate	116,532.00	
Amount from old ledger	10,039,339.51	
		10,350,415.99
Debit balance at close of year		$10,298,802.40

The work done for the year was as follows:

	1876-77.	1875-76.	Inc. or Dec.	P. c.
Train mileage, pass.	1,089,833	1,085,229	Inc.	4,604 0.8
" " freight	558,671	578,658	Dec.	19,987 3.5
" " service	56,298	.....	....	....
Total	1,704,802	.....	....	....
Passengers carried	4,978,255	4,796,275	Inc.	181,980 3.8
Passenger mileage	68,502,002	69,453,812	Dec.	951,810 1.4
Tons freight carried	704,810	634,508	Inc.	70,302 11.1
Tonnage mileage	39,099,659	34,224,383	Inc.	4,875,276 14.3
Av. pass. train load, No	62.86	64.00	Dec.	1.14 1.8
Av. freight train load, tons	69.99	59.14	Inc.	10.85 18.3
Gross earning per train mile	$1.47	$1.186	Inc.	$0.284 23.9
Net earning per train mile	0.47	0.308	Inc.	0.162 52.6
Average receipt per passenger per mile	2.068 cts.	2.030 cts.	Inc.	0.038 ct. 1.9
Average receipt per ton per mile	2.480 "	3.150 "	Dec.	0.670 " 21.2

Of the total number of passengers 1,356,564 were on season tickets. Of the passenger mileage 16.7 per cent., and of the tonnage mileage 38.7 per cent. were of business to and from other roads.

There was a decrease in passenger traffic, but an increase in both through and local freight and a somewhat more encouraging state of business than for the previous year.

Renewals and improvements for the year include 2,205 tons new steel rails and 68,000 new ties; the placing of automatic signals at all switches on the main line; new bridges at North Conway and Union; passenger depots at Marblehead and Belmont; several new coal sheds, and a general repair of fences and minor work neglected in former years. The equipment was increased by 32 freight cars.

There has been no increase of debt during the year, all current expenses having been promptly paid. The litigation with the Boston & Maine as to old business with the Portland, Saco & Portsmouth has been finally adjusted. The questions at issue with the Portland, Saco & Portsmouth as to the lease have been settled and the debt of that company provided for. The suits brought by stockholders of the Eastern Railroad of New Hampshire or in their interest are still unsettled. Proceedings have been begun to settle the right of the company to pay interest on the Portsmouth, Great Falls & Conway bonds.

The Massachusetts Supreme Court has decided that creditors holding ten-year notes as collateral are entitled to receive certificates of indebtedness only for their respective claims computed as cash as of Sept. 1, 1876, and only upon surrender of the notes held as collateral.